A Presidential Address

ON

TEN YEARS OF LUNACY TREATMENT IN LEWISHAM INFIRMARY.

Delivered to the Members of the West Kent Medico-Chirurgical Society on May 4th, 1906, at the Miller Hospital, Greenwich, S.E.,

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GENTLEMEN,—The question of lunacy and its early treatment has of late occupied so prominent a position in both professional and lay journals that an excuse is scarcely needed for publishing a record which I believe to be unique.

A short history of the origin of the method adopted in Lewisham on my recommendation will help to elucidate a somewhat complex procedure. Until 1894 there had been no separate infirmary in this district. The sick were treated in wards in the workhouse, the nursing was mainly effected by old pauper women under some trained supervision, and the medical officer had also the charge of a large Poor-law district as well as a large private practice. A room in a small cottage capable of holding two beds sufficed for the female lunatics, whilst a dark shed containing four beds accommodated the males. A padded room, damp, with a leaky roof and of a very antique pattern, served for the temporary restraint of both sexes. What happened when a male and a female needed restraint simultaneously I do not know. The institution weighbridge, over which every vehicle entering the workhouse necessarily passed, was situated immediately behind the padded room and its rattle, together with the noise—vehicular, equine, and human—attendant upon its use could scarcely have exerted a soothing influence upon the excited occupant. The lunacy procedure in vogue at that time appears to have consisted in the transfer of the alleged lunatic to an asylum as soon as the necessary certification had been effected. Apparently only those cases were admitted to the workhouse which were too violent to be treated even temporarily at home or where the domestic circumstances demanded immediate removal. Cases falling into the hands of the police as wandering lunatics have always been handed over to the Poor-law authorities at once. The removal of a patient recovering from delirium tremens to the county asylum resulted in a series of grave charges against the management. A Local Government Board inquiry exonerated the officers concerned, but it was generally felt that some change of method was desirable and on my appointment as medical superintendent of the new infirmary in 1894 I found the way clear for the adoption of a plan which I had already instituted in St. George-in-the-East. The system is, briefly, the detention of all cases of alleged lunacy concerning whom the aid of the Poor-law authorities has been invoked for a period not exceeding 17 days in the infirmary. At first I had to make shift with two small wards in the infirmary, allowing four beds for males and seven for females. There was no padded room and yet in the five years which elapsed before the building of the present mental block in only 28 cases was it necessary to use mechanical restraint, which has never exceeded the temporary employment of a long-sleeved jacket whereby the arms are confined to the sides. The movement was heartily supported by the bench of magistrates and notably by Mr. Brownlow Poulter, Mr. William Brown, and more recently by Dr. Ralph Gooding, the Deputy Lieutenant of the county. In 1899 the present mental block was opened. It affords accommodation for 11 male and 11 female cases, with a padded room for each sex.

The provisions of the Act of 1890 are somewhat confused reading, but in practice the working is very simple. The attention of the relieving officer having been called to a case of mental disturbance, he adopts a course of action varying with the financial and mental condition of the patient. If he be technically a pauper (a term which is inclusive and elastic) and he be obviously off his mental balance the relieving officer deals with him under Section 20 and removes him to the infirmary where he is received, relieved, and detained for three days. A non-pauper, if the case be urgent, can be dealt with under this section. Within these three days the relieving officer has to give notice to a justice having jurisdiction in the place (Section 14, Subsection 2) who, upon receiving such notice, shall by order require the relieving officer giving the notice to bring the alleged lunatic before him at such time and place within three days from the time of the notice to the justice as shall be appointed by the order (Section 14, Subsection 3). This is effected by the justice visiting at the infirmary. It will be noticed that although the alleged lunatic can only be detained in the infirmary for three days upon the relieving officer's order, yet this officer has three days in which to give notice to the justice, who in turn can defer the examination for another three days, so if a relieving officer gave his notice to the justice at the end of the time allowed by the Act and if the justice were equally dilatory the patient could claim his discharge two days before the date fixed for his examination. Under Section 16 the justice must call in a medical practitioner and must himself examine the alleged lunatic, and if upon such examination he is satisfied that the alleged lunatic is a lunatic and a proper person to be detained, and if the medical practitioner who has been called in signs a medical certificate with regard to the lunatic, the justice may (permissive, not compulsory) by order direct the lunatic to be received and detained in the institution for lunatics named in the order. Now under Section 19, Subsection 1, a justice making an order for the reception of a lunatic otherwise than upon petition may suspend the execution of the order for such period not exceeding 14 days as he thinks fit, and in the meantime may give such directions for the proper care and control of the lunatic as he considers proper, and it is under this subsection that we detain the majority of our cases. The police have equal powers with the relieving officers but as a matter of practice they only exercise them in the case of lunatics, paupers or otherwise, wandering at large, who although separately dealt with under Section 15 yet are subject to an exactly similar procedure. The case of the non-pauper is dealt with under Section 13, which enacts that every constable, relieving officer, and overseer of a parish who has knowledge that any person within the district or parish who is not a pauper and not wandering at large is deemed to be a lunatic and is not under proper care and control, or is cruelly treated or neglected by any relative or other person having the care or charge of him, shall within three days after obtaining such knowledge give information thereof upon oath to a justice, being a judicial authority under this Act. Under Subsection 2 the justice *may* visit the alleged lunatic but he must direct and authorise two medical practitioners to visit and certify. The justice then proceeds in the same manner and has the same powers as if a petition for a reception order had been presented, and under Section 21, Subsections 1, 2, and 3, the justice in these non-pauper cases may now make an order for taking the lunatic to, and receiving him in, the infirmary for a period not exceeding 14 days. Put tersely, a pauper is taken to the infirmary on the judgment of the relieving officer; he must be seen by a justice and by a medical man and when a reception order to an asylum has been signed for him he may be detained in the infirmary for 14 days. A non-pauper has a statement concerning him made upon oath; he must be seen by two medical men at separate times and if their certificates warrant it the justice may commit him to the infirmary for 14 days. The whole procedure is hedged about by restrictions and safeguards; there is nowadays no danger of sane persons being confined in asylums, but rather that persons who ought to have their liberty restricted are allowed to have full scope to ruin themselves and their families.

Having by a somewhat complicated process succeeded in getting our patient committed to our custody let us analyse the different forms of his insanity and the prospects of his cure. During the ten years from 1896 to 1905, 2033 cases of alleged lunacy have been admitted; of these 1020 were discharged either cured or sufficiently recovered for their friends to look after them, 804 were sent to asylums, and 209 died.

This gives a recovery rate of 50·13 per cent., an asylum rate of 39·54 per cent., and a death-rate of 10·3 per cent.

TABLE I.—*Giving Results Year by Year in Percentages.*

Years.	Asylum.	Recovery.	Deaths.
1896	39·6	52·2	8·2
1897	33·9	46·4	19·7
1898	32·8	59·1	8·1
1899	36·7	45·4	17·9
1900	34·2	53·9	11·9
1901	34·7	52·5	12·8
1902	46·6	44·3	9·1
1903	45·4	51·25	3·35
1904	45·5	45·5	9·0
1905	38·5	49·8	11·7

TABLE II.—*Giving the Actual Figures.*

Years.	Asylum.	Recovery.	Death.	Total.
1896	82	108	17	207
1897	67	78	23	168
1898	70	126	17	213
1899	72	89	35	196
1900	66	104	23	193
1901	68	103	25	196
1902	103	98	20	221
1903	109	123	8	240
1904	82	81	15	178
1905	85	110	26	221

TABLE III.—*Giving the Results among Male Patients.*

Years.	Asylum.	Recovery.	Death.	Total.
1896	40	58	14	112
1897	28	49	21	98
1898	31	72	14	117
1899	37	52	26	115
1900	28	59	13	100
1901	25	60	14	99
1902	42	61	18	121
1903	53	76	7	136
1904	35	42	12	89
1905	33	58	21	112
Totals	352	587	160	1099

TABLE IV.—*Giving the Results among Female Patients.*

Years.	Asylum.	Recovery.	Death.	Total.
1896	42	50	3	95
1897	39	29	2	70
1898	39	54	3	96
1899	35	37	9	81
1900	38	45	10	93
1901	43	43	11	97
1902	61	37	2	100
1903	56	47	1	104
1904	47	39	3	89
1905	52	52	5	109
Totals	452	433	49	934

TABLE V.—*Showing the Results among Male Patients calculated in Percentages.*

Years.	Asylum.	Recovery.	Death.
1896	35·7	51·1	13·2
1897	28·6	50·0	21·4
1898	26·5	61·5	12·0
1899	32·2	45·2	22·6
1900	28·0	59·0	13·0
1901	25·3	60·6	14·1
1902	34·7	50·4	14·9
1903	38·9	55·9	5·2
1904	39·3	47·4	13·3
1905	20·5	51·1	28·4
Percentage on the ten years' totals	32·0	53·4	14·6

TABLE VI.—*Showing the Results among Female Patients calculated in Percentages.*

Years.	Asylum.	Recovery.	Death.
1896	46·3	52·6	1·1
1897	55·7	41·4	2·9
1898	40·6	56·25	3·15
1899	43·2	45·7	11·1
1900	40·9	48·4	10·7
1901	44·3	44·3	11·4
1902	61·0	37·0	2·0
1903	53·8	45·2	1·0
1904	52·8	43·8	3·4
1905	47·6	47·6	4·8
Percentage on the ten years' totals	48·4	46·3	5·3

The above figures show conclusively that, *relatively*, more females than males go to asylums, that more males recover than females, and that more males die than females.

During the decade chosen we have had the periods of stress and excitement caused by the Boer war and we have experienced the distress and poverty which invariably follow in the wake of a struggle involving great sacrifice and subsequent retrenchment and monetary stringency. The figures with which we are dealing are, however, too few in numbers and too easily influenced by accidental disturbances to reflect accurately any general and widespread movements, and in addition we have to reckon with the fact that Lewisham has by its rapid development changed during the past few years from a semi-rural locality to a district crowded with small villa residences.

Alcohol.—Alcohol, in accordance with previous experience, is directly responsible for a large number of admissions—471 cases, representing 23·16 per cent. of the admissions from all causes. Of these 403, or 85·5 per cent., recovered; 18, or 3·8 per cent., were sent to asylums; and 50, or 10·6 per cent., died. Thus alcohol furnishes 39·5 per cent. of the total recoveries; 2·24 per cent. of the cases sent to asylums; and 23·9 per cent. of the total number of deaths.

The influence of sex is striking and interesting. The male alcoholics numbered 335, or 71·1 per cent. of the alcoholic cases, while the female alcoholics numbered 136, or 28·9 per cent. Of the 18 cases sent to asylums 13 were males and five were females, the males representing 3·7 per cent. of the total number of males sent to asylums and the females representing only 1·1 per cent. of the number of females sent to asylums for all causes. Of the 403 recoveries 280, or 69·5 per cent., were males and 123, or 30·5 per cent., were females. The male alcoholic recoveries represent 47·7 per cent. of the male recoveries from all causes, while the female alcoholic recoveries account for 28·4 per cent. of the female recoveries from all causes. Of the 50 deaths from alcohol 42 or 84 per cent. were of males and eight or 16 per cent. were of females. The male deaths from alcohol represent 26·2 per cent. of the male deaths from all

causes; the female deaths from alcohol represent 16·3 per cent. of the female deaths from all causes. The male alcoholics represent 30·5 of the total male admissions, the female alcoholics represent 14·5 of the total female admissions. Alcohol is thus *directly* responsible for 23·16 per cent. of the total admissions—i.e., 471 cases were admitted either suffering from delirium tremens or from alcoholic dementia or from mental confusion or delusional insanity occurring in a patient showing unmistakeable signs of prolonged alcoholism. In what proportion alcohol is indirectly responsible for other classes of mental breakdown we have no exact data. Constant nipping or beer-swilling insufficient in amount to cause a condition even approaching intoxication and which would never give rise to delirium tremens *may*, and I believe *does*, by continuous action so impair the brain tissue as to make it less resistant and less capable of maintaining a healthy intellectual equilibrium.

The symptoms of delirium tremens are so well known and so easily recognisable that I do not propose to add to the many descriptions of the disease. The early symptoms in the less severe cases are not so easily diagnosed and may consist of merely a slight tremor of the hands, the tongue, and the lips, and a tendency to talk a little at random; especially is this the case when delirium tremens supervenes in a case admitted for an injury. The first thing noticed is often a confidential and mysterious manner assumed by the patient, unwarranted by circumstances. The subject matter may be the delinquencies of some person of whom you have never heard, or there may be a slight restlessness of the hands or a continual peeping about the ward. When these signs are associated with sleeplessness they should at once be recognised as heralds of an approaching storm. The statement that a cat has been sitting on the patient's bed or that a strange dog has been gambolling about the ward naturally invites the attention and suggests investigation for the discovery of other symptoms. The occurrence of epileptiform convulsions in delirium tremens is not infrequent and is of grave omen. Sudden cardiac failure sometimes occurs. A considerable difference of opinion exists as to whether the sudden cessation of drinking will induce an attack of delirium tremens. I certainly believe that it is so produced, otherwise it is difficult to account for the onset of the condition three or four days after admission in persons in the workhouse who were apparently quite healthy and normal upon entrance. I have seen it develop repeatedly in the infirmary in patients admitted for some minor ailment. They certainly had no suggestion of the condition when they came in and it is equally certain that they had no drink since admission. What else except cessation of the stimulant is to account for the onset of the disease?

The influence of sex is shown in the larger proportion of males—335 men as against 136 women:—

Males.		*Females.*	
Sent to asylums ...	13 = 3·9%	Sent to asylums ...	5 = 3·6%
Recovered	280 = 83·6%	Recovered	123 = 90·4%
Died	42 = 12·5%	Died	8 = 5·9%

The greater recovery-rate and the smaller death-rate amongst females are what would be anticipated from the known greater addiction of the male to drink. He dies from the effect of alcohol upon his heart and so his ultimate mental condition is unknown. Generally a woman has delirium tremens in a more lady-like way than a man. Her hallucinations are not so grotesque and fearsome as those of the male and are mainly confined to mice and smaller vermin, while her struggles are not so strenuous nor are her imaginary labours so intense as those of the male. This is due to the influence of previous occupation. The carman drives ghostly horses, the barman draws imaginary beer and counts elusive coins all with tremendous difficulty and with great stress. The woman's concern is mainly with the bedclothes, which suggest to her some cleansing or sewing operation, still, however, causing much anxiety and perturbation.

Some cases of mental confusion appear to be caused entirely by drink. The patients are usually found wandering by the police and have no hallucinations or feeling of terror but are simply lost and unable to give any account of themselves. They recover with a good purge and a sleep. Many of the women are secret drinkers. Several of them have been cooks from houses in the better class districts. A considerable proportion have been, however, known frequenters of public-houses, which the lowest class of women frequent, perhaps, equally with men. 403 out of 471 alcoholics (85·5 per cent.) recovered and they amount to 39·5 per cent. of the total 1020 recoveries from all causes.

The treatment of delirium tremens involves the greatest care and attention on the part of the medical man and necessitates the employment of trained attendants upon whom absolute reliance can be placed. My routine plan is after a warm bath to give five grains of calomel and one ounce of house mixture, or as an alternative two or three drops of croton oil in hot milk, and to put the patient to bed at once under the charge of a separate attendant. As a matter of course these patients will not want to stay in bed, the horses have to be attended to, or a customer in the front bar wants to be served and they must go at once. Often they can be humoured and coaxed; sometimes they have to be restrained. Now restraint must be at once effective and judicious, and unless kept within well-defined bounds has to be reported to the Commissioners in Lunacy. A patient may not be tied to a bed or any other object, nor may his limbs be tied together or to his body without the reasons for, and the duration of, the restraint being registered and reported, but he may be very completely tucked in by bedclothes and he may have a stout ticking coverlet lashed over the bedclothes to the bed, which will suffice to modify the movements of the majority. Some, however, either burst their coverings or engage in so exhausting a struggle with their imaginary duties that further physical restraint is inadvisable and these patients must be placed in the padded room warmly dressed and with a mattress and pillow to lie upon. If a patient should strip himself or tear off his clothes a canvas suit of trousers and jacket buckling behind may be put on over his clothes. He, of course, will not lie down, but it does him less harm to walk about than to be engaged in a constant struggle. He must be fed at frequent intervals, say every three hours, with warm egg and milk and beef-tea, taking four pints of milk and four eggs in the 24 hours. If he refuses nourishment and will not listen to the suggestion that the cup contains some of his favourite beverage, then he must be fed nasally. To effect this the largest-sized œsophageal tube which will pass into the nose should be used. No. 18 is a usual size, it enters the œsophagus much more easily and does not tend to get into the larynx nor can the patient cough it out into the mouth as often happens to the small-sized catheters generally used. The goal aimed at in the treatment of delirium tremens is the production of sleep, because we know that nine out of ten cases recover if we can achieve that result. In mild cases a hot bath and a good drink of hot milk or beef-tea will be sufficient, but in most instances some drug will be requisite, and I trust that nobody will be sufficiently credulous as to believe the story, still copied into works on therapeutics, of the Jersey practitioner who gave a patient suffering from delirium tremens an ounce of tincture of digitalis by mistake and was amazed to find him cured instead of dead. There are two explanations: either he made a mistake in thinking he had given him tincture of digitalis, or if he really gave it it was inert. A medical man told me 20 years ago that he once tried it; the result was what we might anticipate and it did not encourage a repetition on another patient. Opium and morphine are long in acting and appear to have a cumulative effect in that they act suddenly, and it is difficult to gauge the probable effect which a given dose will produce. Repeated small doses produce no effect at all, then a slightly increased dose produces effects out of all proportion to the increase. To the coal-tar preparations, sulphonal, trional, veronal, I have given an extended trial and have discontinued their use. Their action is too slow and too uncertain, the personal element is difficult to estimate, and the cardiac attacks which occasionally occur during their administration are disconcerting to the friends and dangerous to the patient, while the peculiar and varied skin hues and rashes following their use are not encouraging. I have never seen either sleep or calm produced by the hypodermic injection of any preparation of hyoscine, but, on the contrary, I have often seen intense cardiac depression follow its use. Paraldehyde, except as an emetic, is inert up to doses of half an ounce. In fact, the only combination upon which one can rely is a mixture of 30 grains of potassium bromide and 20 grains of chloral hydrate with a little tincture of lavender and water to an ounce. This may be given every four, three, or two hours for two, three, or four doses according to the severity of the case. Alcohol I do not give, but ten grains of ammonium carbonate in some hot milk, or four minims of solution of

strychnine hypodermically are excellent cardiac stimulants. By keeping a close watch upon your patient you will notice the onset of drowsiness and can then get him into bed where he will sleep soundly for eight or ten hours and be drowsy and perhaps muttering for another 12 hours. At the end of that time his mental condition should be practically cured, but in some cases after a brief period of semi-consciousness he drifts into a condition approaching coma characterised by low muttering delirium, dry tongue, collection of sordes upon the teeth and lips, and incontinence of urine and fæces, he lies flat on his back and takes no notice of anything, he asks for nothing, and if let alone, beyond moving his head from side to side and some non-purposive movements of the arms, he will remain in the supine position. His heart becomes rapid from peripheral neuritis of the vagus and if he does not succumb to hypostatic pneumonia he may develop peripheral neuritis of the legs or paralysis of the intercostals or diaphragm from the same reason. The treatment for the condition is scrupulous cleanliness, attention to the back and heels to avoid bed-sores, and catheterisation of the bladder; turning the patient from one side to the other at intervals of an hour and fixing him in the desired position by pillows. This will enable the upper lung to act with freedom and it also prevents the accumulation of blood at the bases of the lungs. The most careful attention must be given to the toilet of the mouth, otherwise inflammation and swelling and possibly abscess of the parotids will ensue from a spreading septic infection of the duct. Nasal feeding is usually requisite although sometimes fluid may be carefully administered through a feeding cup. Large doses of ammonium carbonate internally and three or four minims of solution of strychnine hypodermically four-hourly form the most successful line of treatment.

There is a condition of alcoholic dementia into which a drinker may lapse after any acute illness without any suggestion of delirium tremens. He hovers between semi-consciousness and semi-coma. He recovers when roused and recognises his friends when sufficiently pressed. He will take food so long as too much trouble in mastication is not required. He can get out of bed and can walk, or rather stagger, round the room. He will talk sensibly for a minute or so and then relapse into incoherency. He is usually jaundiced, with a foul tongue and with a slightly increased range of temperature. His dangers are hypostatic pneumonia and peripheral neuritis, otherwise he may recover in two or three months.

After an attack of delirium tremens the bodily health may be entirely regained and yet the mental condition may be one of varying degrees of dementia which may range from a mere loss of memory for recent events to a total inability to appreciate environment. These are the cases which, classed as alcoholics, we transfer to the asylums.

Delusional insanity.—The next group is that of delusional insanity and here the dividing line between this group and melancholia is not very definite. Many delusional patients are depressed and most melancholics have delusions. I have included in the delusion class all those where the delusion appears to be primary and where the depression (if existing) seems to be the result of the delusion, and amongst the melancholics I have classed those whose delusions have apparently arisen from antecedent mental misery. Out of 407 admissions 283, or 69·5 per cent., were sent to asylums; 118, or 29 per cent., recovered; and six died.

Males (178 admissions).		*Females (229 admissions).*	
Sent to asylums ...	110 = 61·8%	Sent to asylums ...	173 = 75·5%
Recovered	63 = 35·4%	Recovered	55 = 24·0%
Died	5 = 2·8%	Died	1 = 0·5%

Considering the cases as a whole, it seems strange that 29 per cent. of cases admitted for so grave a condition as delusional insanity should recover in the short period of, say, 17 days. I have no doubt that in some of these recoveries the exciting cause of the breakdown has been alcohol, although there has been no suggestion of tremor or other indication of delirium tremens. Pulmonary tuberculosis is a frequent cause of delusional insanity, and here an improvement of the general health is often associated with a loss of the delusion. Cardiac valvular disease is another cause. Uterine myomata and other abnormal womb conditions are sometimes associated with delusions and their removal or alleviation is followed by mental equilibrium. I recall one case where I removed an ovarian cyst in a woman whose delusions of persecution disappeared on her restoration to health.

Another point which would repay elucidation is the after-history of these delusional cases. How many of them turn out to be early cases of general paralysis where the mental symptoms have preceded the physical. We rarely see a case of general paralysis in a woman in an infirmary and yet they are not uncommon in asylums. Many of these cases are suicidal and necessarily require constant supervision. Some may be homicidal but I can recall only one definitely homicidal case in the whole of my experience, although many had distinct ideas of persecution by definite persons. A sudden accession of resentment and a favourable opportunity might furnish the exciting cause for the commission of a deed of violence and where the idea of killing is entertained it is generally associated with a feeling of affection for the intended victim, who is usually a wife or child, most of the would-be executioners being alcoholics in a state of delusional depression. Again, most of the male suicides are depressed alcoholics. The majority of suicides and attempts at self-destruction which come under my notice occur in young women and the chief point of interest is the relatively unimportant motive which leads to the act. "My mistress was cross with me," is a very frequent reason alleged. The favourite poison at present is the disinfectant solution supplied for the asking by the borough council, which, whatever its bactericidal properties may be, is not followed by any great fatality when taken as a beverage. A few days ago a woman took half a pint of it "because her teeth ached," which seems a trivial reason for wishing to terminate her existence. Spirits of salt (commercial hydrochloric acid) is easily obtained and evidently has a reputation as an agent for self-destruction; its effects are awful and the lingering sufferings of its victims are pitiable in the extreme. Both men and women occasionally attempt to drown themselves in the Ravensbourne; they always think better of it, its smell is so pungent that, although anxious to face death, they are not prepared to meet it in so horrible a form. Cut-throats are mostly males; occasionally a woman attempts it, but it is a very half-hearted performance. I presume that topographical anatomy is not yet a compulsory subject at the Council schools, as the carotids continue to escape. It is sometimes strange that they are not injured. I recall a case where the trachea and œsophagus were completely severed and the vertebral column deeply nicked by a razor without any important artery being cut. After careful suturing of the divided structures he recovered. Gun-shot attempts are confined to males. As an example of a determined suicide may be mentioned a man who threw himself from a window and broke his neck. The fracture could easily be felt both behind and in the pharynx. The spinal cord was not injured. By encasing his shoulders, neck, and head in plaster-of-Paris we obtained very good union of the fracture, and as his delusions persisted he was, after some weeks, transferred to one of the county asylums. After a few months he was discharged and within a few days of obtaining his freedom he threw himself under a brick-cart, this time with success.

Melancholia.—This condition is responsible for 233 admissions, of whom 141, or 60·5 per cent., were sent to asylums; 91, or 39·5 per cent., recovered; and one died (a female committed suicide). Of the 80 males, 41, or 51·25 per cent., were sent to asylums; and 39, or 48·75 per cent., recovered. Of the 153 women, 100, or 65·3 per cent., were sent to asylums, and 52, or 33·3 per cent., recovered. Comparing the sexes, we note that 153, or 65·6 per cent., were women, and 80, or 34·3 per cent., were men. The asylum rate of women is greater than men—65·3 per cent., as against 51·25 per cent. The recovery rate is less—33·3 per cent. of women, as against 48·75 per cent. of men.

In both delusional insanity and melancholia the line of treatment is the same. Search for some physical cause, examine every organ carefully—the lungs, the heart, and the uterus. The digestive tract will inevitably be out of order. Constipation is always present. Pyorrhœa alveolaris, with its attendant foul discharge into the mouth, swallowed and absorbed, is a frequent accompaniment. Some of these cases of depression have mouths which are charnel houses of decayed teeth. Start with a brisk purge, five grains of calomel or five grains of blue pill, followed by a saline draught, attend to any faulty bodily condition, give the patients sleep by means of a full dose of chloral, keep them in bed, and if they are of poor nutrition, as is usually the case, feed them up with abundance of milk and eggs.

Mania.—Of 149 cases of mania 49, or 32·9 per cent., were those of men, while 100, or 67·1 per cent., were those of women. 123, or 82·5 per cent. of these cases, were sent to asylums; 21, or 14·1 per cent., recovered; and five cases, or 3·3 per cent., died. Of the 49 males, 36, or 73·4 per cent., were sent to asylums; 11, or 22·4 per cent., recovered; and two, or 4·1 per cent., died. Of the 100 females, 87 per cent. were sent to asylums; 10 per cent. recovered; and 3 per cent. died.

The line of treatment must be, first, attention to the bowels and feeding and sleep. It is for these patients that a padded room is almost essential. Their actions are so sudden and their violence so spontaneous that they can neither be trusted nor left unattended. Exaltation is rarely confined to one emotion. An augmentation of religious feeling is always associated with a desire to sing and also with a marked increase of eroticism manifested by a desire to strip and to indulge in self-abuse.

Stuporose conditions.—These conditions account for 141 cases, of which 61, or 43·26 per cent., were those of men, and 80, or 56·7 per cent., those of women. 56, or 39·7 per cent., of the total were sent to asylums; 82, or 58·1 per cent., recovered; and three, or 2·1 per cent., died, one of these being a female case of myxœdema. Of the 61 males, 27, or 44·2 per cent., were sent to asylums; 33, or 54·1 per cent., recovered; and one, or 1·6 per cent., died. Of the 80 females 29, or 36·25 per cent., were sent to asylums; 49, or 61·25 per cent., recovered; and two, or 2·5 per cent., died. This class includes all those cases characterised by loss of memory and by an inability adequately to appreciate environment and which range from a slight mental confusion to a blotting out of all previous experience, together with a marked limitation of the power of receiving fresh impressions. The mother who, overworked by domestic duties, over-taxed by a too frequently recurring maternity, "finds the children too much for her" and feels muddled. The person who wanders away from home and is found some days after by the police, footsore, weary, and very dirty, unable to give a name or any connected history represents the other end of the sequence. These cases resemble the delusional and melancholic classes very much, the delusional element being absent and the mental confusion being much more pronounced. I believe it to be due to a toxic condition and for causation and treatment I have nothing to add to the suggestions made for delusional insanity and melancholia.

General paralysis of the insane.—This class was represented by 83 cases, 79, or 95·2 per cent., being men and four, or 4·8 per cent., being women. 72, or 86·7 per cent., were transferred to asylums; five, or 6 per cent., recovered their mental equilibrium sufficiently to be handed over to their friends; and six, or 7·2 per cent., died. Of the 79 males, 69, or 87·3 per cent., were asylum cases; four, or 5 per cent., improved; and six, or 7·6 per cent., died. Of the four women three were sent to asylums and one improved.

Senile dementia.—This condition furnishes 190 cases, of whom 119, or 62·6 per cent., were males, and 71, or 37·4 per cent., were females. 29, or 14·7 per cent., of these were sent to asylums; 68, or 35·8 per cent., recovered sufficiently to warrent their discharge; and 93, or 49 per cent., died. Of the 119 males, 14, or 11·7 per cent., were sent to asylums; 32, or 26·8 per cent., were relieved and restored to their friends; and 73, or 61·4 per cent., died. Of the 71 females, 15, or 21·2 per cent., were sent to asylums; 36, or 50·7 per cent., were relieved and restored to their friends; and 20, or 28 per cent., died. Senile dementia varies markedly in degree and ranges from a slight forgetfulness for recent events to a condition indistinguishable in its intensity from acute mania. In its common form the patient may be to all appearance perfectly rational during the day, but as evening approaches restlessness becomes marked, the sense of present environment is lost, and the patient is translated to some earlier epoch of life. If a woman she is with her children. Sometimes they are babies and she is nursing them or is fearful that they are in danger of being burnt; sometimes they are grown up and she is directing a daughter to perform some domestic action. In old men the thoughts wander back to work, although occasionally from phrases and gestures employed, a tavern carousal would appear to be the concern on hand. I have never observed the slightest sexual suggestion either in men or women.

There is a growing feeling that cases of senile dementia should not be classed as lunatics. The county asylums object to their presence because they are incurable, they occupy valuable and needful space, and they depress the recovery ratio in a marked manner. The Metropolitan Asylums Board asylums superintendents also object to them—an objection which appears somewhat unreasonable as the Metropolitan Asylums Board asylums were built especially to relieve workhouses from the presence of these cases. Old people who cannot find their way about a ward, who are unable to recognise their own beds, who prowl about the place in a semi-nude condition, who try to get into bed with other inmates and who resent their exclusion, who sing and chatter and call upon imaginary persons all night, who would, if not prevented, light fires upon the floor, are not sufficiently docile to be retained in ordinary workhouse dormitories, while their presence in an infirmary ward would be intolerable. If the asylums will not have them it must mean the erection of separate incurable mental blocks. From the relatives' point of view it is regrettable that an affection which is really due to senile decay rather than to disease should inflict the stigma of insanity upon the family stock. The high male death-rate is accounted for by the fact that the acutely maniacal cases, and which are nearly all fatal, occur much more frequently in men. Again, fewer women are admitted because they are much more easily managed at home and when treatment has quieted them down the friends receive a mother or grandmother back again much more readily than they will an old man. A woman is much more docile and domesticated, whilst a restless old man is an intolerable nuisance in a small house.

For treatment the milder cases who turn night into day and *vice versâ* should be kept awake at day and put to some light work; there is then more chance of them sleeping at night. In these, as in other cases, I believe that a full dose of bromide of potash and chloral hydrate, 30 grains of the former and from 20 or 25 of the latter, is the best and safest hypnotic. Small doses by cutting off the control of the higher centres and increasing the automatism of the patient's actions aggravate the restlessness and garrulity.

Epilepsy with mental derangement.—These conditions supplied 112 cases, 81, or 72·3 per cent., being those of males, and 31, or 27·7 per cent., those of females. In 22 males and in ten females the mental symptoms, which consisted in violence and hebetude after a fit, were sufficiently marked to necessitate their detention in an asylum. In 53 males and in 21 females the condition was sufficiently alleviated to permit their return home. Six males died in the condition known as status epilepticus. The treatment of epilepsy is exceedingly unsatisfactory; except in acute conditions I rarely administer drugs.

Idiocy.—Idiocy accounts for 75 admissions, 50, or 66·6 per cent., of the patients being males, and 25, or 33·3 per cent., being females. 18 males and five females were transferred to idiot asylums, the friends of 30 males and 19 females were induced to take them again under their care, and two males and one female died from intercurrent affections.

Temper.—In temper as a cause of admission we have instances of wild ungovernable outbursts which were alarming and of maniacal intensity in some cases. The sexes are nearly evenly balanced—ten males and nine females, all of whom recovered. The discipline of a mental ward, with the faint suggestion of a lunatic asylum in the background, is a splendid corrective.

Malingering.—There were seven cases of malingering, all the subjects being males. Some were old asylum patients who evidently desired to return to a haven of comparative rest from the strife of competition. One was a simulation of the popular conception of hydrophobia, enacted by a youthful mime to impress the female employees of a drapery establishment. The interrupted current terminated the performance.

Cardiac mania.—This condition, in which the mental affection was obviously the result of valvular disease, was responsible for seven admissions, three males and four females. One patient, in whom a noisy dementia supervened, was sent to the asylum; four patients recovered and two died.

Delirium.—There were 19 cases of delirium, ten males and nine females. In one case of acute delirious mania, that of a male, the patient was sent to the asylum. The other patients were the subjects of symptomatic delirium, of enteric fever, pneumonia, gangrene, epitheliomata, &c. Six patients recovered and three died.

Hysteria.—Of 48 cases of hysteria three of the patients

were males and 45 were females. They all recovered. All were the subjects of emotional storms of prolonged duration.

Mental derangement associated with gross brain lesions.—There were 38 cases under this heading, 28 of the patients being males and ten being females. Some were cases of cerebral hæmorrhage, some of brain tumours, while others were those of syphilitic endarteritis. Two of the patients were sent to asylums, 15 recovered, and 21 died.

Puerperal mania.—This condition was responsible for 25 cases. 21 patients were sent to asylums, three recovered, and one died.

Amongst unclassified cases were the following: one case of a male who was the subject of pernicious anæmia with delusions and who died; another of a male who suffered from locomotor ataxy with delusions and who recovered his mental balance; a third of a male who had contracted the cocaine habit and had suffered from delusions and who recovered; three cataleptic cases among females (one was sent to the asylum and the other two recovered); and two cases of domestic infelicity in which the wife succeeded in securing the temporary incarceration of a husband with an ill-regulated temper, both being released after examination.

My object in choosing this subject for my presidential address is to bring to your notice the curability and the temporary nature of the large proportion of mental cases. 50·3 of our cases have recovered; 39·54 only have gone to asylums. As honorary secretary of the lunacy committee of the Metropolitan Workhouse and Infirmary Medical Officers Conference I have collected the figures for London for the last four years.

Years.	Cases.	Sent to asylums.	Cured.
1902	8076	3920	3569
1903	8004	3792	3443
1904	7654	3716	3155
1905	7322	3583	2877

These figures show that so far from lunacy having increased in London it has in four years steadily decreased, being 754 less in 1905 than in 1902, the numbers sent to the asylum from the workhouses and infirmaries being also 337 less. I strongly urge that the Lewisham system should be everywhere adopted and that no case should be sent directly to an asylum, but that all should go through the sifting process of the infirmary half-way house. For cases who are not paupers a difficulty at once arises, for directly an institution be established to deal solely with mental cases, whether in their incipient or later stages, it immediately becomes in the eyes of the public a lunatic asylum and the stigma of lunacy adheres to all who accept its help. The solution is in attaching a mental block to each general hospital, an arrangement beneficial to both the public and the profession. I would discourage the practice which still obtains in a few districts of certification by the family attendant of the justice. I know of one case where a consulting oculist was given a turn at a pauper case in a London workhouse. A strange practitioner, seeing the patient for a few minutes, then and there determining his destination, to the exclusion of the medical officer who has all the available knowledge concerning the individual and all the responsibility of his care and treatment, reduces the working of the Act to a mere farce.

May I, in conclusion, express the opinion that the result we have achieved in Lewisham is one of which we may justly feel proud. It has required, and it has received, the loyal coöperation of all authorities—of the Blackheath bench of magistrates, of the Lewisham board of guardians, and the medical officers and the relieving officers. The knowledge that 1020 persons have been spared from being branded as lunatics cannot be other than a source of gratification to all concerned.

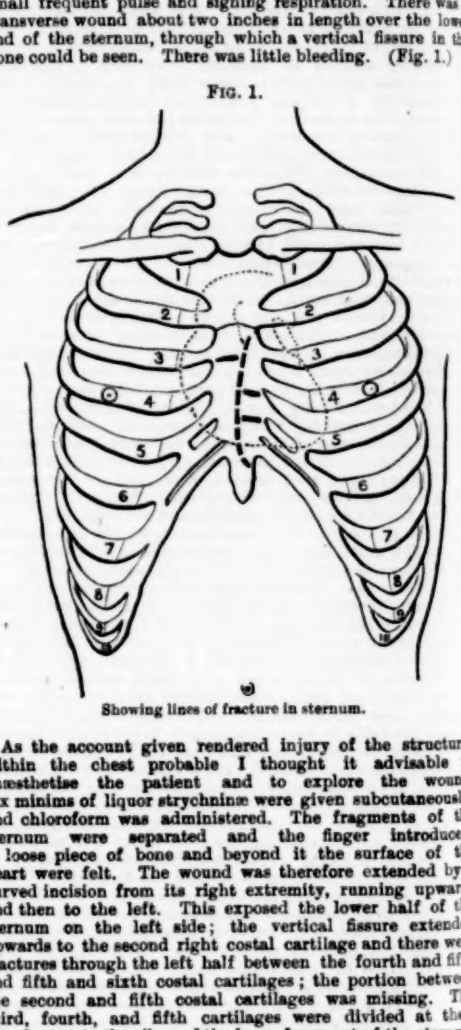
PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—The sixty-fifth session of the School of Pharmacy of this society will commence on Monday, Oct. 1st, when the President will present the Pereira medal, and the inaugural sessional address will be delivered by Sir George Watt, M.B., C.M., C.I.E.

SUTURE OF PERFORATING WOUND OF THE HEART; DEATH ON THE ELEVENTH DAY.

BY FREDERICK T. TRAVERS, B.S. LOND., F.R.C.S. EDIN.,
HONORARY SURGEON TO THE WEST KENT GENERAL HOSPITAL.

AT 11.30 A.M. on June 21st the patient, an active lad, aged 19 years, after climbing over the surrounding fence, some six feet high, scrambled on to the upper stone of the cromlech known as Kit's Coty House. This stone is about eight feet from the ground and the railings are about three feet distant from it. He attempted to leave by stepping on one of the longer spikes of the fence from the stone. In doing so his foot slipped and he fell forward and was impaled on the spike. He managed to lift himself free and fell inside the fence. Nearly an hour elapsed before medical aid could be obtained or the assistance necessary to lift him on a hurdle over the fence. He was brought to the hospital by Dr. T. A. Palm of Aylesford at 2.45 P.M. I saw the patient immediately after his arrival at the hospital; his clothing was saturated with blood, he was just conscious, blanched, with small frequent pulse and sighing respiration. There was a transverse wound about two inches in length over the lower end of the sternum, through which a vertical fissure in the bone could be seen. There was little bleeding. (Fig. 1.)

FIG. 1.



Showing lines of fracture in sternum.

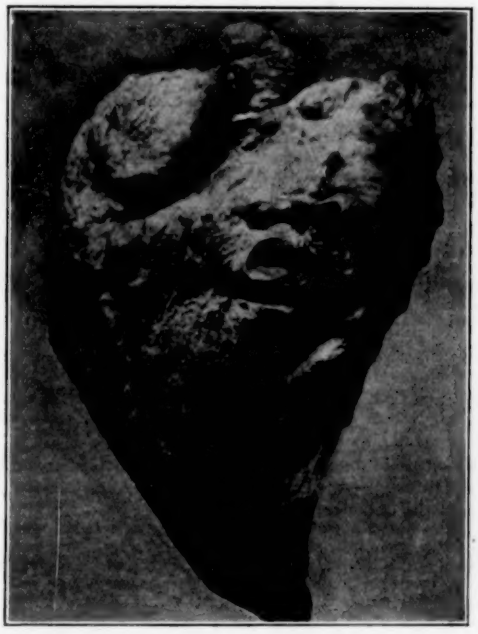
As the account given rendered injury of the structures within the chest probable I thought it advisable to anæsthetise the patient and to explore the wound. Six minims of liquor strychninæ were given subcutaneously, and chloroform was administered. The fragments of the sternum were separated and the finger introduced. A loose piece of bone and beyond it the surface of the heart were felt. The wound was therefore extended by a curved incision from its right extremity, running upwards and then to the left. This exposed the lower half of the sternum on the left side; the vertical fissure extended upwards to the second right costal cartilage and there were fractures through the left half between the fourth and fifth and fifth and sixth costal cartilages; the portion between the second and fifth costal cartilages was missing. The third, fourth, and fifth cartilages were divided at their attachment to the ribs and the lower fragment of the sternum

was turned downwards. In freeing the third cartilage the pleura was wounded. The rent, about half an inch in length, was at once clipped with artery forceps and closed by two sutures. A rent in the pericardium about two and a half inches in length was now exposed through which blood was slowly escaping. The pericardium was full of blood-clot which was gently sponged away, a piece of bone one inch by half an inch was removed, and a small spicule of bone was felt imbedded in the heart and extracted. On further examination a wound was felt in the right ventricle and on following this along another piece of bone was felt. This was seized with forceps and removed and its removal was followed immediately by a terrific gush of dark blood. I at once plugged the wound in the heart by plunging my fingers in and found that the insertion of three fingers practically stopped the hæmorrhage; I also found that my fingers were within the cavity of the heart, the index being separated from the middle and ring fingers by a band of tissue, which at the time I took to be the anterior flap of the tricuspid valve. Three sutures were inserted, withdrawing a finger as each was passed and by them the wound was roughly drawn together, and then ten sutures were passed through the muscular coats, using the first three, which were left long, to steady the heart and bring the wound into view. A second row of ten Lembert sutures were passed through the pericardial serous coat closing in the first row. The wound was now quite closed and no bleeding was going on. After the first flow of blood transfusion into the saphena vein of the right leg was commenced but was stopped as the immediate increase of blood pressure increased the hæmorrhage. The transfusion was continued when the first row had been tied. The contractions of the heart became very lively as each suture was inserted and but for this somewhat violent stimulus it appeared several times that pulsation would have ceased. The pericardium was cleansed with gauze and partly closed with a row of sutures, the fragment of sternum was replaced, and the wound was closed except at its upper and lower angles. The fragments of the third and fourth costal cartilages, having their sternal ends also detached, were not replaced. The wound was irrigated freely with sterilised water and dressed with double cyanide gauze.

During the operation a second hypodermic injection of six minims of liquor strychninæ were given and at 5 P.M., when the patient was in bed, a further injection of five minims was given; also an enema of saline solution (half a pint) and brandy (half an ounce). His pulse was 116, regular, and of fair force, but small volume. He recovered consciousness by 5.30 P.M. and complained of thirst and was given sips of lime-juice and water. At 7 P.M. he was restless and sick. The dressing had come through but was not disturbed. The temperature was 97·8° F. The sickness continued at intervals through the night. On the 22nd, at 5 A.M., half an ounce of brandy and the white of an egg in half a pint of saline solution were given as an enema and at 7 A.M. three minims of liquor strychninæ. At 8 A.M. the temperature was 100°, the pulse was 116, and the respirations were 30. At 9 A.M. the enema was repeated; the patient was rather drowsy. The injection was repeated at 12.30 P.M. and 3.30 P.M. The patient complained of no pain, but a feeling of weight in the chest and slept a few minutes at a time all through the day. The pulse-rate kept at about from 120 to 130, but the respiration rate rose at 2.30 P.M. to 72, falling by 5 P.M. to 61. The wound was dressed at 7 P.M. There was no hæmorrhage but free serous discharge. He was given an enema of half an ounce of brandy and half a tin of Brand's essence was given in five ounces of saline solution. He slept most of the night quietly, but on waking occasionally would have an attack of restlessness with difficulty in breathing. The enemata were repeated every four hours. At midnight the pulse was 120 and the respirations were 48. He took sips of water or milk-and-water continually when awake. A few râles were heard over the base of the left lung in the axillary region but no signs of pneumothorax were present. On the 23rd the wound was dressed at 1.30 A.M. There was a free serous discharge which was slightly turbid. The respirations were 45. The pulse was 118 and more thready than ever before; it improved after five minims of liquor strychninæ were given hypodermically. During the night he had six bouts of restlessness, all following the same course, the pulse first becoming thready and more frequent; an attack of dyspnœa followed with some pain in the chest, the patient becoming restless for a time. During the day these attacks were slighter and less frequent and he slept most of the time. He was very thirsty and took about three ounces of milk-and-water every hour. On the 24th at 12.30 A.M. the pulse was 144 and irregular. The patient was sleeping quietly. He had a fairly comfortable day. There was free discharge from the wound, which was dressed twice. The fluid draining from the wound was serous and evidently pericardial; the quantity soaking into the dressing was very considerable. At midday there was a very free escape of fluid, and after this his breathing and pulse improved very much and he had no severe dyspnœic attacks during the rest of the day. On the 25th he was still very thirsty and drank milk and albumin water freely. He was sleeping well and quietly, but his breathing was noisy when awake; a few râles were still present. At 3 P.M. he had a slight rigor; the pulse was very thin and 135 per minute. He was given a hypodermic injection of three minims of strychninæ and six minims of tincture of digitalis, and at 4 P.M. the pulse was much improved—126 per minute. On the 26th the patient had passed a very fair night. He was rather faint at 6 A.M. but improved after five minims of liquor strychninæ had been administered hypodermically. The wound was dressed at 8 A.M. and 5 P.M. The bowels were freely opened after an enema of soap and water and two drachms of turpentine. He had a comfortable day but perspired freely at times. No râles were to be heard now and breathing was quite easy.

The patient's condition improved a little each day till June 29th. The wound was dressed every eight hours after the 26th as the lacerated skin and subcutaneous tissue at the site of the original injury appeared likely to slough. On

FIG. 2.



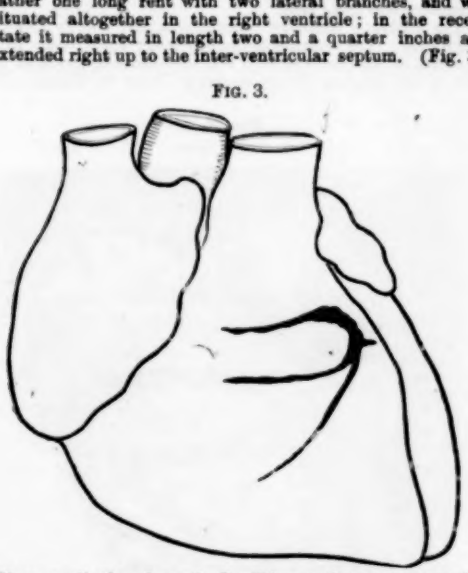
Appearance of heart after removal. The stitches have been removed and the wound opened up. The left ventricle has been cut away up to the interventricular septum.

the 28th some of the stitches were removed as they were cutting through the skin. The wound was irrigated at first with biniodide solution 1 in 4000 and later with sterilised water and lightly packed with gauze. On the 29th the wound was clean and more healthy except at the edges of the fissure in the sternum where there were a good many shreds of necrosing aponeurotic tissues. On the 30th he had several attacks of faintness and at 11 P.M. there was a little blood on the dressing but no hæmorrhage was apparent on

removing the gauze. He became more restless later and wandered a good deal and died at 2.30 A.M. on July 1st.

At 2.30 P.M. on July 1st an examination was made of the injuries. On opening up the wound there was some recent lymph seen about the divided rib cartilages. There was no blood or clots. The edges of the fractured portions of sternum were necrotic and a further fracture was found running transversely just below the third costal cartilage. The wound in the pleura could not be found. The pericardial wound, two and a half inches in length, was healed with the exception of about a third of an inch in the centre. On opening up the pericardium a clot was seen covering the heart, partially organised and adhering somewhat firmly to it. This was carefully removed and several ounces of dark fluid blood removed from the pericardium; there was no pus in the sac. The wound in the heart was difficult to determine except at its left and upper extremity, the greater part being covered by smooth lymph. The heart was removed with as little handling as possible. (Fig. 2.) There was some recent and firmly adherent lymph on the auricular appendages, chiefly on the right, around the bases of the great vessels, and on the left ventricle, but little on the right ventricle except about the wound. The wound in the heart was well closed except at a point where a small portion of the muscular wall between two parts of the rent showed signs of necrosis. The rent was trifid externally, or rather one long rent with two lateral branches, and was situated altogether in the right ventricle; in the recent state it measured in length two and a quarter inches and extended right up to the inter-ventricular septum. (Fig. 3.)

FIG. 3.



Diagrammatic view of wound. It will be seen that one tear extends to the interventricular septum.

From within the rent appeared to be more irregular and was somewhat)—(-shaped and was only healing at the extremities of the various parts of the rent.

The most noticeable features of the case were the plugging of the wound in the heart by the detached fragment of sternum, which almost entirely stopped the bleeding, and the tolerance shown by the heart to the injury and the handling required at the operation. Pulsation continued regularly while three fingers were held in the wound with their tips within the cavity of the ventricle. The loss of blood was very considerable even then, but the insertion of each suture was observed to act as a very immediate stimulus, and after the insertion of the first row, when the heart's action had become very feeble, the insertion of the second superficial layer of sutures stimulated its action so that it became more regular and forcible. In view of the enormous loss of blood, it was remarkable that there was so little collapse; there was, further, no air-hunger or delirium, though symptoms of cerebral anæmia were, so far as possible, averted by keeping the foot of the bed well raised. The patient recovered consciousness within half an hour of being put to bed and was conscious and rational throughout. The severe injury to the pericardium again, though inducing excessive secretion of pericardial fluid, was accompanied by no symptoms, owing to the free drainage afforded to the sac by the incomplete closure of the wound in it. The cause of death was apparently failure of the heart's action due to the pressure of the clot slowly forming on its anterior surface, which also blocked the pericardial wound and prevented the escape of the blood oozing from the gap in the wound in the heart and not directly due to the slight secondary hæmorrhage.

In conclusion, I wish to say that I am much indebted to Dr. Joseph Ward, house surgeon to the hospital, for his assistance in keeping the notes of the case and for his constant attention to the patient during the 11 days he survived the accident.

Maidstone.

A STUDY OF THE STREPTOCOCCI PATHOGENIC FOR MAN.

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I. INTRODUCTION; DIFFICULTIES IN CLASSIFYING STREPTOCOCCI; GORDON'S METABOLIC TESTS.

ALMOST from the time when streptococci were first shown to be connected with certain morbid conditions in man the problem of the identity or non-identity of the types found in different diseases has been actively discussed. One of the earliest disputes concerned the relationship between Fehleisen's streptococcus of erysipelas and that found by Rosenbach in acute suppurations and named by him streptococcus pyogenes. It is now generally conceded that the two organisms are identical, representing at most two differing phases of virulence. In recent years the innumerable bacteriological investigations which have been carried out upon diseased conditions of every kind have shown that streptococci are associated with a large number of acute and chronic inflammatory affections and blood infections, so that to-day they are justly regarded as amongst the most important of pathogenic bacteria. This advance in our knowledge of their importance and commonness in the production of disease has not, however, been associated with any corresponding advance in our power of discriminating between the different varieties of streptococci concerned. With the introduction of serum-therapy the problem has entered upon a more acute phase. Anti-streptococcal serum occasionally works miracles but is more often without effect of any kind, and it has been suggested that one reason for this may be that there are various species of streptococci at work, and that the miracle comes off when by chance the serum has been produced by immunisation with the same organism as happens to be the cause of the disease. The need for some means of discriminating between the different sorts of streptococci has become greater than ever.

Some pathologists, notably Marmorek, to whom we owe the introduction of anti-streptococcal serum, have stoutly maintained the unity of all the streptococci pathogenic for man. Marmorek based his chief argument upon the facts that bouillon in which one sort of streptococcus has grown is incapable of serving as a culture-medium for any other sort and that all alike show similar hæmolytic power. The general demand for a multivalent serum shows that this view has not gained wide credence amongst the medical profession.

There have hitherto been no satisfactory criteria for judging of the specific characters of the various streptococci occurring in disease. Morphology has proved of little value. The size of the individual cocci varies too little to be of service. More hopeful is the length of the chains formed. In 1891 von Lingelsheim proposed a division into two groups based on this criterion; he suggested the terms "streptococcus brevis" for the short-chained forms rendering broth uniformly turbid and for the most part

non-virulent, and "streptococcus longus" for the long-chained forms, those in which the long chains settle down as a flocculent or granular precipitate, leaving the supernatant broth clear; he showed that the majority of virulent forms belong to this latter type. No doubt there is a certain substratum of convenience and, indeed, of truth in such a division, but as a basis of systematic classification it is inadequate. In one and the same culture chains of the most varying length may be found; the length of the chains may vary according to the chemical composition of the medium in which the coccus grows and may vary on subculture. The length of chain depends upon the degree of cohesion between its constituent cocci, which is not a sufficiently fundamental character. Nevertheless, it is certainly true that some streptococci tend to grow in short chains and some in long, and that short-chained forms are less frequently and intensely pathogenic than long-chained forms. Morphology is, in our opinion, of some degree of value in classification, and should be taken into account, in connexion with other and more fundamental characters. A convenient terminology, as regards length of chain, is as follows: "brevissimus," for the forms occurring chiefly as diplococci; "brevis" for somewhat longer chains (e.g., of from four to eight elements); "medius," for forms showing chains of moderate length (e.g., from eight to 16 elements); "longus" for the long-chained forms; "longissimus" for chains of inordinate length; and "conglomeratus" for those long-chained forms which are contorted into dense balls. The "brevis" types habitually render broth uniformly turbid, while the "longus" and "conglomeratus" types show a clear broth with a stringy or granular deposit; the "medius" type is intermediate in this respect. But no sharp line separates these various types and the terms are merely of convenience in description. Gordon has drawn attention to the occurrence of bacillary forms in certain streptococci when grown on solid culture media, more particularly on blood serum. This character may perhaps prove of some value in classification, but our knowledge of the distribution of these bacillary forms is too incomplete for any final verdict.

Cultural characters upon ordinary laboratory media are of very little value apart from the growth in broth. The minute differences in the modes of growth upon gelatin and agar-agar are too variable for purposes of differentiation. There is, however, one biological feature which we think of definite value—namely, the temperature requirements of the various types. Fischer has introduced the convenient terms "psychrophil" for those bacteria growing best at the ordinary summer air temperature and "mesophil" for those growing best at the temperature of the human body. All the pathogenic streptococci naturally belong to the mesophil group, but while some are capable also of vigorous psychrophil growth others are incapable of growth at 20° C. In judging of this point attention must be paid to the precise temperature of the incubator, for even 2° C. may make all the difference as to whether a given streptococcus does or does not show visible growth on gelatin. A very few streptococci possess the power of liquefying gelatin; we have met with two or three such types to which allusion will be made later. It is doubtful whether more stress should be laid upon such a character than upon the other chemical characters to which we shall have to draw attention.

Staining properties are of no value whatever in differentiating the streptococci. They all stain well with the ordinary basic anilin dyes; none are acid-fast and all the pathogenic forms which we have investigated stain well by Gram's method.

Pathogenic power has naturally received much attention in the attempts to distinguish the different streptococci from one another. It may be looked upon from two points of view—the clinical and the experimental, and these do not invariably coincide in their indications. A streptococcus may be the cause of a septicæmia or of an inflammatory affection in man and yet produce little or no effect when inoculated into an experimental animal. There is, it is true, a broad general correspondence in pathogenic effect upon man and rodents, but it is not universal. In this paper we propose to deal only with those forms of streptococci which we have found clinically to be pathogenic for man. For practical purposes the only test of virulence which can be employed as a routine in examining the streptococci is animal inoculation, the mouse and the rabbit being the most suitable animals. There is a circumstance which deprives this test of a good deal of its value as a means of discriminating between different sorts of streptococci—namely, the great readiness with which virulence is lost and gained by these organisms. After only a week or two on culture media, and in the case of pneumococci after only a day or two, virulence may largely be lost. On the other hand, after one or two passages through a susceptible animal a streptococcus of only feeble virulence may become intensely pathogenic. One and the same strain of streptococcus may at different stages in its career produce now a rapidly fatal septicæmia, now a spreading erysipelas, now a localised suppuration, and now no effect at all. The difficulty may be in part overcome by invariably testing the streptococcus upon an animal immediately upon its isolation from a case of human disease, but it remains true that, useful though it be as a subsidiary test, pathogenesis cannot be employed as a fundamental character for the classification of the streptococci.

The various serum reactions, again, which may be induced against streptococci have so far failed as a means of accurate discrimination between them. Agglutination tests carried out by us with the serum of an animal immunised against a given streptococcus upon a whole series of other streptococci have indeed shown that considerable differences exist; but they are graduated differences, not sufficiently defined to be of more than subsidiary help in classification. Moreover, the technique of streptococcus-agglutination is troublesome and disappointing. No sufficient data are to hand as to the bactericidal and opsonic reactions against streptococci to warrant any conclusion as to their taxonomic value; there is as yet no evidence that any rigidly *specific* limits can be assigned to such reactions even though generic differences may exist.

The difficulties above outlined amply account for the doubt and uncertainty which have hitherto attended the systematic classification of the streptococci. But there remains the possibility of differentiating them by their chemical powers or metabolic reactions—a possibility which has received a remarkable impetus from the recently published work of Dr. Mervyn H. Gordon. Such metabolic differences have already proved of signal service in the differentiation of the members of the bacillus coli group, and it may fairly be argued that ability to utilise this or that foodstuff is a character of quite as fundamental a nature as any that morphology can offer. Some few tests of this nature have been in use for a considerable time—e.g., the power of clotting milk—but Dr. Gordon has been the first to approach the matter in a comprehensive way. His researches are embodied in a paper contributed in the report of the medical officer to the Local Government Board for 1903–04[1] and have since been summarised by him in THE LANCET.[2] His method consists in preparing a sugar-free broth and adding to it 1 per cent. of the test substance, together with some litmus. Ability on the part of the streptococcus to utilise the test substance as food is indicated by vigorous growth with the appearance of a sharp acid reaction. He first tested 33 chemical substances, belonging to the carbohydrates, glucosides, and polyatomic alcohols, upon a series of ten diverse streptococci. Many of these substances were affected uniformly by all ten streptococci, others by none at all, and such substances were rejected as of no differential value. A number of the substances showed, however, marked differences between the different streptococcal strains and from these he selected seven as of special differential value. They included two disaccharides—saccharose and lactose; one trisaccharide—raffinose; a polysaccharide—inulin; two glucosides—salicin and coniferin; and one alcohol—viz., mannite. To these seven tests he added the clotting of milk and the reduction of neutral red, the latter under anaerobic conditions. These nine tests we shall refer to briefly as "Gordon's tests." He proceeded to apply them to a large number of strains of streptococcus, 300 in all, isolated from normal saliva, and he found that he could distinguish no less than 48 chemical varieties. The research was primarily undertaken with the view of ascertaining whether any tests could be found for distinguishing the streptococci of saliva from those of other origin. He tested also a few streptococci from miscellaneous sources, including some from disease-processes in

[1] Vol. xxxiii., p. 388.
[2] THE LANCET, Nov. 11th, 1905, p. 1400.

man. Dr. A. C. Houston applied Gordon's tests (excluding the coniferin test) to 300 streptococci from normal human fæces and found that they fell under 40 different chemical types. His results are contained in a paper in the same volume of the Local Government Board Reports as the paper by Gordon just alluded to. He has since published in a report to the London County Council on the Bacteriology of Milk the results of Gordon's tests as applied to 172 strains of streptococci from milk. More than two years ago we began to apply these tests to all streptococci which we could procure from human sources in disease, limiting ourselves to those cases in which there was a reasonable presumption that the streptococcus had a direct or secondary connexion with the disease process. We included the pneumococci in this inquiry, regarding them as members of the streptococcal group. We have now examined considerably over 200 strains of streptococci and pneumococci from human disease-processes, and we consider that we have accumulated sufficient material to warrant us in putting our conclusions before the medical profession. We propose in the first place to offer our criticisms upon Gordon's tests as a whole and to state the value which we have been led to place upon them, and secondly, to tabulate our detailed results as a contribution to the classification of the streptococci pathogenic for man.

II. GENERAL CRITICISM OF GORDON'S TESTS AND OF THE CONCEPTION OF "SPECIES" AMONGST BACTERIA.

We have already shown how other criteria fail to discriminate sharply between various strains of streptococci. This defect cannot well be urged against the series of metabolic tests which Gordon has devised. The error here is in the contrary direction, and there is no little danger that by a blind insistence on the importance of this or that individual chemical test we may tumble into the pitfall of unwarranted species-mongering. Gordon himself has been careful to abstain from claiming specific value for his different chemical types, but he has not ventured to propose any reasoned scheme of scientific classification based upon his tests. The tests are to a large extent empirical and arbitrary and the groups into which his 300 salivary streptococci fall remind one of the Linnæan system in botany. Had he employed 20 tests instead of nine it is probable that instead of 43 he would have found 100 or more varieties amongst them. It cannot too strongly be insisted that in classifying bacteria attention must be directed to the sum total of biological characters. The difficulty lies in deciding which of the chemical tests are to be regarded as fundamental and which of subsidiary importance. It is clear that they impose upon the organisms subjected to them a set of gymnastic exercises in chemical decomposition which are of varying difficulty. The monosaccharides are too easily broken up to serve as a test at all. The disaccharides, saccharose and lactose, are somewhat more difficult to deal with but offer a relatively easy task, for they are far more frequently attacked than any of the other bodies in Gordon's series; more than 90 per cent. of the pathogenic streptococci can utilise these disaccharides as food. The trisaccharide, raffinose, is a much harder nut to crack and only 21 per cent. of the pathogenic streptococci can attack it with success, while only 3 per cent. of the group can ferment the polysaccharide, inulin. The pneumococci, on the contrary, readily attack raffinose (74 per cent. of those we have investigated) and some 25 per cent. of our pneumococci have been able to attack inulin. The glucosides, salicin and coniferin, are more readily decomposed by streptococci than the higher carbohydrates. No less than 73 per cent. of the pathogenic forms attack salicin, while coniferin is broken up by 28 per cent. The polyatomic alcohol, mannite or mannitol, has been fermented by 21 per cent. of our pathogenic series. As regards the two remaining tests milk has been clotted by 34 per cent. and neutral red reduced by 24 per cent. of our series.

Precisely how the cocci chemically attack the test bodies is at present a matter of conjecture, but we shall probably be near the truth if we assume it to be by the production of specific enzymes which perhaps break up the more complex carbohydrates and glucosides into the simpler monosaccharides; these may then be split up by an enzyme common to the whole group. We have endeavoured to judge of the value of Gordon's tests in two ways. In the first place we have repeatedly tested given strains as to the constancy of the reactions displayed, and in the second place we have carefully considered how far differences revealed by the tests are associated with other differences, such as may be shown by cultural and other biological characters, by pathogenic powers, and by distribution in nature.

The constancy of the tests is clearly a cardinal point; unless they can be shown to be reasonably constant their value breaks down at the outset. We have no hesitation in asserting that the reactions are remarkably constant for any given strain of streptococcus, and though we shall have to lay stress on certain exceptions to this rule it will only be for the purpose of discussing the relative value of the different tests in any scheme of classification which may be based on them. This constancy has been tested in several ways. 1. Several different colonies from the original culture have been simultaneously tested. In almost every case the results have been identical, though occasionally the salicin reaction has been at fault in this respect. The chief exceptions have been cases such as perforative peritonitis, in which it is reasonable to suppose that several varieties of the rich flora of the gut have simultaneously escaped into the peritoneum, or such as tonsillitis, where an analogous explanation holds good. 2. Cases have been compared in which it was reasonably certain that different patients had been infected from the same source. Opportunities for such observations are necessarily uncommon but we may quote two instances. A woman was admitted to hospital suffering from puerperal septicæmia, from which she died. From the heart's blood and from the uterus a streptococcus was cultivated which gave positive reactions with saccharose, lactose, salicin, and mannite. Three days later the infant which she had borne succumbed to erysipelas and pyæmia, and from the pus in its wrist-joint a streptococcus was isolated in pure culture, giving reactions identical with those of the maternal organism. Again, two children died in hospital within a few days of one another, the one from septicæmia associated with cellulitis of the neck and the other from septicæmia associated with a gastro-enteritis due to Gärtner's bacillus. In each case a pure culture of a streptococcus was isolated from the heart's blood, giving the same reactions as those of the mother and child just quoted, and in each case the mannite reaction was lost after a week's subculture on gelatin. It so happened that one of us had tested one case and one the other, and when we came to compare notes, struck by the corresponding loss of the mannite reaction, we discovered that the two patients were brothers, admitted to the hospital during the same week, the one to a medical and the other to a surgical ward. These instances gain in force from the fact that the streptococcus in question is by no means one of the commonest types met with in disease. We regard it, as will appear later, as a variety of streptococcus pyogenes. 3. The tests have been repeated after prolonged subculture, in some cases extending over a year. Here again the results are singularly constant and exceptions are infrequent. One example must suffice. There is a form of intestinal streptococcus growing in short chains, reacting positively to all of Gordon's tests, except raffinose and inulin, and possessing the power of rapidly liquefying gelatin: it is not pathogenic. An old culture left in the incubator for nine months was recently revivified and showed all the old reactions unchanged, including liquefaction of the gelatin. We could give other instances of this pertinacity of type. Nevertheless we must record other cases in which slight differences have been noted. We have already alluded to two cases in which the mannite reaction was speedily lost; in other instances reactions with salicin and neutral red have been both lost and gained; these two latter tests seem indeed more liable to vary than most of the others. 4. We have repeatedly tested the reactions of pathogenic streptococci before and after passage through the mouse, and we can confirm Gordon's statement that the reactions are almost invariably unchanged, though we have once or twice found the salicin reaction to vary. We have on one occasion pursued the same streptococcus through a series of infections. A woman died in hospital from a septicæmia secondary to ulcerative stomatitis. From the blood during life a streptococcus was isolated which grew well on gelatin at 20° C., failed to clot milk, and readily attacked lactose and salicin. It gave a feeble saccharose reaction and by the ninth day (a point far beyond that to which most of our observations extend) coniferin and mannite gave also an acid reaction. From the heart's blood post mortem and from the pus in a knee-joint a streptococcus was grown in pure culture which gave the same reactions. The saccharose reaction was feeble and on this occasion no reactions occurred with coniferin and mannite by the seventh day. One of us (T. J. H.) had the misfortune to prick his finger at

the post-mortem examination and suffered from a very severe lymphangitis and local suppuration which under prompt treatment with univalent pyogenes serum and free incision ran a favourable course. The pus from his wound yielded a streptococcus which fermented saccharose, lactose, and salicin, but now the saccharose was more vigorously attacked than the lactose. The organism was inoculated into a mouse which succumbed in three days. The streptococcus recovered from the mouse fermented saccharose, lactose, and salicin equally well and proved a typical streptococcus pyogenes. Cases such as this are particularly instructive, showing that even such cardinal reactions as those with the di-saccharides may vary somewhat with varying degrees of virulence. 5. We have the tested reactions under varying external conditions. It seems to us probable that slight differences in the composition of the medium may possibly affect the series of reactions to some little extent. And it is clear that free access of oxygen may have an important influence. In one case a streptococcus which appeared certainly to be an example of streptococcus pyogenes altogether refused to attack lactose under aerobic conditions. But on the exclusion of oxygen lactose was readily fermented—i.e., the need for increased chemical activity under anaerobic conditions seemed to evoke a latent power in the coccus. We have not done sufficient work on this branch of the subject to justify us in making any precise statements as to the influence of anaerobic conditions in modifying Gordon's tests, though it would be a matter well worthy of investigation. The neutral red test has no value at all unless it is carried out anaerobically. We would repeat that, despite the instances to the contrary which we have adduced, the constancy of the reactions for any given strain of streptococcus is on the whole remarkable.

We now pass to the second method by which a judgment may be formed as to the value of Gordon's tests—namely, the correspondence between differences revealed by them and differences of other kinds, such as distribution in nature, pathogenesis, and other biological characters. From the critical point of view this consideration is of even greater moment than the constancy of the reactions. In order to gain the necessary data for forming an opinion on this subject one of us (F. W. A.) undertook the correlation of all the published records obtainable in which streptococci had been tested by Gordon's methods. These are now sufficiently numerous to form a fair basis for criticism. The normal flora of the mouth is represented by Gordon's 300 strains and that of the intestine by Houston's 300. There are also Houston's 172 colonies from milk and more than 200 from air tested by Gordon and published in his report on the Ventilation of the House of Commons (1906). Gordon had examined some 20 pathogenic species and we ourselves have raised that number to over 200. Further, one of us had examined a goodly number of strains from fresh air, sewer air, sewage, milk, and the intestines of herbivorous and carnivorous animals. Altogether there were more than 1200 records of colonies tested. These were entered on suitable printed charts and were then sorted and arranged, so far as might be, into groups and sub-groups. In this way a tentative classification was reached, based upon the metabolic tests, and a broad, general survey of the matter was for the first time possible. At the first glance the results of this laborious correlation were somewhat disheartening. The number of chemical types was bewildering; they were connected by innumerable transitional forms and no clue existed as to which tests were fundamental and which subsidiary, though it was already apparent that some (e.g. the salicin and neutral red tests) were more variable than others. There was, however, one guide which, as in all such taxonomic problems, proved of the greatest help—namely, the numerical frequency of occurrence of any given type. When any arbitrary set of characters is taken as a basis for the classification of a group of natural objects the same phenomena are usually seen—large groups of like objects connected by small groups which differ from them in only one or two particulars. If the numerical frequency of each individual like group is represented by the proportional height of a vertical line and the lines are arranged in series the commoner types stand out boldly above the rarer ones. Only in nature they are plotted out, not in linear series, but in space of two dimensions, as it were, so that the common types stand out as mountain tops above their fellows, each mountain connected by valleys of intermediate types with many of its neighbours. If now the mountains were cut off by a horizontal plane half way up their sides and attention were paid only to the mountain tops, disregarding the valleys, we should have the popular conception of species. The biologist, on the contrary, is more concerned with the intermediate types in the valleys, as illustrating variation and the connexion between allied species. In some groups of plants and animals the mountains are few and high and the valleys very deep. These are the groups which are, so to speak, in a stationary condition—which are not rapidly varying and adapting themselves to new conditions. In other groups, which biologists call "dominant genera," the mountain tops are numerous but not so high and separated by only shallow valleys; these are the groups which are at the moment succeeding in the struggle for existence. We believe that the streptococci are such a group.

Applying the above conception to the streptococci as differentiated by Gordon's test, some sort of law and order is at once introduced into the maze of chemical types, so that they begin to fall into a relatively small number of predominant groups connected by many intermediate forms. A clue is thus afforded as to which are the more and which the less important of the individual tests, though we must confess that no one test has appeared to us infallible. Help is also given by other biological characters, such as length of chain, pathogenesis, hæmolytic power, ability to grow at 20° C., and capacity for resisting desiccation.

III. Proposed Classification of Streptococci based upon all Characters and including Gordon's Tests.

Taking all these conditions into account the classification of the streptococci became much clearer. We do not propose to enter here in detail into the large question of their general classification but we will state the general conclusions to which the study of the 1200 or so individual colonies has led us. Before doing so we will quote in detail the facts as to one small group of streptococci as an illustration of the chemical variations which may exist within the limits of what is almost certainly a single species, though not a pathogenic one. By far the commonest streptococci in the air of London are forms with chains of medium length, incapable or barely capable of growth at 20° C., forming little or no acid in milk, and quite incapable of fermenting lactose. The positive tests in Gordon's series are saccharose and the two glucosides (salicin and coniferin). Gordon had met with these forms in great abundance in air and one of us (F. W. A.) had also found them the commonest air streptococci in some investigations at Hampstead. They correspond with none of the ordinary human saprophytic streptococci, and the most likely source for them seemed to be the horsedung which forms so large a part of the organic contamination of London air. This view proved correct. On examining fresh horsedung it was found that streptococci were present to the number of 10 million per gramme, far exceeding all other bacteria in numerical abundance, and that these particular air streptococci were the chief sort present, other varieties being present only up to 100,000 per gramme. Further, these forms proved remarkably resistant to desiccation, withstanding drying on garnets for several months. It was thus reasonably certain that this form of streptococcus, which seems entitled to rank as a species, was usually derived from horsedung, or perhaps also from the intestines of other herbivora; it was not found in the intestine of certain carnivora examined (the fox and the stoat). Now the chemical reactions of individual strains, though constant on subculture, varied within certain limits. Most frequently both saccharose and the two glucosides were fermented, but often one or more of the reactions was suppressed. The variations are shown in the following table.

Table I.

—	Reactions with Gordon's nine tests.									Frequency in 94 air colonies.	Frequency in 13 horse-dung colonies.
	Milk clot.	Neutral red.	Saccharose.	Lactose.	Raffinose.	Inulin.	Salicin.	Coniferin.	Mannite.		
1	·	·	+	·	·	·	·	·	·	7	0
2	·	·	+	·	·	·	+	·	·	18	4
3	·	·	+	·	·	·	·	+	·	1	0
4	·	·	+	·	·	·	+	+	·	36	3
5	·	·	·	·	·	·	+	+	·	26	5
6	·	·	·	·	·	·	+	·	·	6	1

Here, then, are six different chemical types within the limits of what, on broad general grounds, must be regarded as a single species of streptococcus. No one of the reactions is constant, but the limitation of the reactions to saccharose and the glucosides is constant, and the specificity of the group is emphasised by the absence of an acid reaction in milk and by inability to grow on gelatin at 20° C. The type, as evidenced by numerical frequency, is clearly number 4. The variants are "variants by suppression" of one or other reaction. It is probable that there exist also "variants by addition," for a common air streptococcus shows an inulin reaction added to saccharose, salicin, and coniferin, and another less common one shows addition of both inulin and raffinose (the latter variant having been found once in horsedung). Further, there are closely allied forms which reduce neutral red. The series above adduced illustrates at once the strength and the weakness of Gordon's tests as a specific guide in classification. The weakness is plain when unsupported by other evidence, for a streptococcus giving, for instance, a positive reaction with saccharose only might equally well, as we shall show, be a pneumococcus or a virulent type of streptococcus pyogenes. And the strength is this, that a streptococcus from the mouth fermenting only saccharose, salicin, and coniferin, non-pathogenic, and incapable of growth on gelatin at 20° C., may with some confidence be referred to inhaled horse-dung. The series serves also to illustrate the principles of classification which have guided us in our preliminary attempts to group the streptococci according to their chemical properties.

Turning now to the 1200 or so specimens of streptococci which have been tabulated from all sources, saprophytes and parasites together, they may be roughly grouped as follows.

A. The saprophytic group above mentioned which seems derived from the herbivorous intestine and may be termed "*streptococcus equinus*." Its characters have already been sufficiently described; so far as is known it is totally devoid of pathogenic properties. There are records of 152 specimens conforming to the main types (i.e., fermenting only saccharose and the glucosides), derived chiefly from air, dust, and horse-dung, but including 17 from human saliva, 23 from human fæces, and one from urine. The variants which in addition give reactions with raffinose and inulin number 95 specimens (45 from air and dust, and 50 from human fæces and saliva). Variants giving also a neutral red reaction number 29 specimens.

B. The second group is still essentially saprophytic, occurring chiefly in human saliva and fæces, but is occasionally associated with disease. It is a short-chained form capable of good growth on gelatin at 20° C., and it gives a marked acid reaction in milk, though no clotting. Further, it almost always ferments lactose. These characters fail to separate it very clearly from Type A, but they do not sharply define it from Type C, the true streptococcus pyogenes. The only reasons which induce us to separate Types B and C are that Type B is habitually short-chained and non-pathogenic, and never associated with suppuration, while Type C is habitually long-chained, virulent, and typically associated with suppurative processes, being found only occasionally as a saprophyte. These differences are vague, and we are inclined to regard Type C as a parasitic form which has been evolved from Type B and is not yet sharply separated from it. Type B has been found with almost equal frequency in saliva and in the intestinal contents. In 132 specimens it has only nine times been found associated with disease processes and only once or twice has there been reason for regarding it as truly pathogenic. Such forms may with fair propriety be regarded as variants of Type D in which the power of clotting milk has been suppressed. Some name must for convenience be given to this type and we would suggest "*streptococcus mitis*" as a non-committal term fairly expressing its habitually non-virulent character. It may be defined as a short-chained form, almost never pathogenic, inhabiting the human alimentary canal, growing well on gelatin at 20° C., not clotting milk but often reducing neutral red. Its typical positive reactions with Gordon's tests are saccharose and lactose with or without the glucosides. 58 specimens are recorded as of this type; raffinose or inulin reactions were also present in 10 further specimens and reduction of neutral red in 64 more. This saprophytic type is of chief interest as the probable form from which the virulent streptococcus pyogenes has arisen.

C. The third group is one of the utmost importance in human pathology, having as its type the classical organism first described by Fehleisen as "streptococcus erysipelatos," but since more generally known by Rosenbach's name, "*streptococcus pyogenes*." We adhere to the latter term because, though Fehleisen's name has undoubted priority, this species does so much more than produce erysipelas that the wider term deserves to supplant the narrower. This type has assumed more definitely parasitic characters than any other sort of streptococcus and in its fully-developed form seems not to occur as a human saprophyte, though some of its variants have been met with in saliva and fæces. Its characters are as follows. It is a long-chained form usually growing in woolly masses at the bottom of a clear broth; occasionally the broth is somewhat turbid and the chains of only medium length. It grows vigorously on gelatin at 20° C. It is actively hæmolytic but does not form H_2S in broth culture. It strongly acidifies milk but never clots it, nor does it reduce neutral red (those allied forms which do so we refer to Type D; they commonly show other differential characters in addition). The usual positive reactions with Gordon's tests are saccharose, lactose, and salicin, but a variant lacking the salicin reaction is quite common. It is highly pathogenic for the mouse and rabbit, somewhat less so for the guinea-pig, though it often produces a local suppuration in this animal. When freshly isolated from a case of human disease it generally produces a fatal septicæmia in the mouse in two or three days. In its commonest form, giving reactions with saccharose, lactose, and salicin, it has been met with 33 times in human disease and five times doubtfully associated with disease processes, but never as a saprophyte except as a short-chained form (Type B). In one case, of a child suffering from an acute and rapidly fatal pharyngitis, an organism was obtained from the tonsil in almost pure culture which in all respects resembled the classical streptococcus pyogenes, save that it rapidly liquefied gelatin.

Any one of the three cardinal reactions may be suppressed, giving variants which we shall describe later in detail. Further, certain reactions may be added, notably mannite or coniferin, without any other change in the general characters of the type. (Variants also occur in which raffinose and inulin reactions are added, but we have some grounds for regarding these as modifications of Type D in which the power of clotting milk has become suppressed.) The variants by suppression and by addition of mannite and coniferin account for 38 cases in which the organism was definitely pathogenic and 15 in which it was otherwise associated with disease processes. 15 such variants are recorded from normal saliva and fæces.

D. There is a form of streptococcus so characteristic of saliva, though it is also common in the intestine, that the term "*streptococcus salivarius*" may justly be applied to it. It is the form often spoken of as streptococcus brevis of the mouth, but so many other forms are also short-chained that some more distinctive appellation is needed. No less than 211 out of the 300 salivary streptococci studied by Gordon fall under the possible variants of this type and 105 out of Houston's 300 fæcal streptococci (i.e., it is proportionately twice as common in the mouth as in the intestine). Its variants pass by insensible gradations into those of the commonest intestinal form (Type F) which we describe as "streptococcus fæcalis," and we are unable to draw any absolute distinction between the two forms. Streptococcus salivarius, even in its short-chained form, plays no unimportant part in human pathology, and we have it recorded as pathogenic in 26 cases. But it appears to bear the same relation to the much more pathogenic long-chained form which we describe as Type E, that streptococcus mitis does to streptococcus pyogenes. There seems to be no distinction between them other than that the long chained forms are more highly pathogenic. Type E is really a parasitic form of Type D, but it is found much more frequently than streptococcus pyogenes as a saprophyte of the normal alimentary canal of man and animals.

The typical characters of streptococcus salivarius are as follows. It is a short-chained form which usually renders broth uniformly turbid, though sometimes the broth is clear with a deposit of short chains. It grows less constantly than Types B and C upon gelatin at 20° C. Sometimes it will grow, but often not. It clots milk almost always and in its typical form reduces neutral red, though variants occur which fail to do this. The characteristic fermentation

reactions are saccharose, lactose, and raffinose, the last-named less constantly than the first two. The glucoside reactions may be added, and rarely inulin.

Streptococcus salivarius is related in many ways to the pneumococci, which may prove to be a pathogenic offshoot from it. It is possible that some of Gordon's specimens from saliva were really pneumococci, but he paid no attention to the question of capsules. Streptococcus salivarius, however, is certainly not identical with the pneumococcus, being for the most part non-pathogenic; the pneumococcus, moreover, very rarely reduces neutral red.

E. This is the pathogenic long-chained form of streptococcus salivarius, and seems to have a special connexion with inflammation of the fauces and with scarlet fever. If, as some maintain, the cause of scarlet fever is a streptococcus, the particular sort of streptococcus is probably to be found within the limits of this group. Our data as regards scarlet fever will be given later and will be found far from conclusive. Meanwhile, since this particular type of streptococcus occurs in other sore-throats, and indeed in the normal alimentary canal, as well as (less commonly) in other diseased conditions, we would suggest the term "*streptococcus anginosus*" as not inapplicable to it.

The characters of streptococcus anginosus are as follows. It is a long-chained form, producing in broth a flocculent deposit like that of streptococcus pyogenes. The differences between it and pyogenes are that, more often than not, it will not grow on gelatin at 20° C., that it is only rarely associated with suppuration, and that it habitually clots milk and reduces neutral red. Nevertheless, a number of its variants fail to clot milk and form transitions to streptococcus pyogenes. We cannot draw a hard and fast line between the two. Like pyogenes, it is markedly hæmolytic. In its chemical reactions it is practically indistinguishable from streptococcus salivarius. The type-reactions are: clotting of milk, reduction of neutral red, and acid formation with saccharose and lactose, to which raffinose is often added. Other variants include the glucosides and in rare cases inulin. This long-chained form is recorded 32 times from the normal throat and intestine and has also been found in the intestine of both carnivora and herbivora. We have met with it 16 times in ordinary diseases and 38 times in disease processes (principally scarlet fever) where we could not feel certain that it was the causal agent.

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G. There remain the *pneumococci*. We have tested 34 strains in the same way as we have tested the pathogenic streptococci. We have found many varieties, but with one exception we consider that they may all be referred to a single species. The one exception is an isolated example only which will be mentioned later. The distinguishing mark of the pneumococci is the possession of a capsule when growing in the animal body and in certain culture media. On ordinary media this capsule is not apparent and the cocci frequently form chains of considerable length, so that there seems no justification for removing the pneumococci from the genus streptococcus.

A critical examination of the seven groups of streptococci above enumerated will at once reveal the fact that the grouping is arbitrary. The different kinds to which we have given names shade off into one another by imperceptible gradations and the view which we have adopted as to variants by suppression and by addition renders it frequently uncertain to which type a given form of streptococcus should be referred. We would meet such criticism in advance with the remark that this indefinite state of affairs actually represents the condition found in nature. We regard the streptococci as a "dominant genus" which has specially adapted itself to a saprophytic existence in the alimentary canal of man and animals. Under the favourable conditions there offered, the food-supply being abundant and highly varied, the genus has, as it were, specialised in metabolic powers so that a great variety of races has sprung up differing in their precise capacities for attacking different foodstuffs. Some of these races have prevailed numerically above their fellows and are on their way to become distinct species though still connected by transitional forms. Further, certain of them have begun to adapt themselves to a truly parasitic existence; some, such as streptococcus pyogenes, have done so with marked success and are already amongst the most formidable bacterial foes with which the body has to contend; others are mere facultative parasites of a much lower degree of virulence.

What we have done in our attempt to sort out the chemical types hitherto recorded has been to select those types which have thus prevailed numerically and to apply names which may serve to indicate them, not perhaps as well-defined species but as species in the making, already so distinct as to deserve special appellations. The less abundant intermediate forms have been fitted in, as well as might be, as variants of the more prominent forms. It is probable that in the present state of our knowledge no more sharply defined classification of the streptococci is possible and that the scheme above outlined fairly represents the actual medley of types seen in nature, and the way in which, by the processes of evolution, nature herself is sorting out the medley. A certain element of arbitrariness is inevitable in any attempt of the kind. Whether the precise criteria we have selected are the best and most fundamental is another matter; we can only plead that we have done our best to introduce some sort of order into what has hitherto been a perplexing maze, and we venture to believe that some such conception of the streptococci as we have set forth is preferable to the idea that they are all one kind or that they present a hopeless chaos.

Having thus set forth the results of the attempted correlation of the varied types of streptococci revealed by the application of Gordon's tests to the 1200 or so specimens recorded, a further criticism may be possible as to the value of those tests. We have shown that their constancy is sufficiently great to warrant reliance upon them. We consider that, in addition, the variations which these tests reveal correspond sufficiently with variations in other characters to make them the best available guide through the labyrinth of forms. We find that we can more readily "place" a streptococcus, and surmise its source and probable virulence, by the aid of Gordon's tests than in any other one way. These tests are capable of good and of bad use. We have given sufficient reason for the belief that in themselves they are too arbitrary for a systematic classification. Probably no one of the nine tests is of absolute and constant worth, while several are certainly of little value. Reliance on these tests alone must result in a purely empirical scheme of classification of little real scientific utility. But taken in conjunction with other characters the tests appear in a very different light and afford a clue to the nature of any given form of streptococcus which is invaluable. The introduction of these tests by Gordon is, in our judgment, the most important advance which has been made in recent years in the study of the streptococci.

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BRIXHAM COTTAGE HOSPITAL.—Lord Churston is endeavouring to raise £5000 as an endowment for the cottage hospital at Brixham in Devonshire. The population of Brixham consists almost entirely of fishermen and their families, and the cottage hospital performs an admirable work in assisting the men employed in the large fishing fleet, of which Brixham is the headquarters, in cases of accident and sickness. Already over £800 have been promised as a commencement of the fund, and it is hoped that with an effort the full amount will be subscribed.

Here, then, are six different chemical types within the limits of what, on broad general grounds, must be regarded as a single species of streptococcus. No one of the reactions is constant, but the limitation of the reactions to saccharose and the glucosides is constant, and the specificity of the group is emphasised by the absence of an acid reaction in milk and by inability to grow on gelatin at 20° C. The type, as evidenced by numerical frequency, is clearly number 4. The variants are "variants by suppression" of one or other reaction. It is probable that there exist also "variants by addition," for a common air streptococcus shows an inulin reaction added to saccharose, salicin, and coniferin, and another less common one shows addition of both inulin and raffinose (the latter variant having been found once in horsedung). Further, there are closely allied forms which reduce neutral red. The series above adduced illustrates at once the strength and the weakness of Gordon's tests as a specific guide in classification. The weakness is plain when unsupported by other evidence, for a streptococcus giving, for instance, a positive reaction with saccharose only might equally well, as we shall show, be a pneumococcus or a virulent type of streptococcus pyogenes. And the strength is this, that a streptococcus from the mouth fermenting only saccharose, salicin, and coniferin, non-pathogenic, and incapable of growth on gelatin at 20° C., may with some confidence be referred to inhaled horse-dung. The series serves also to illustrate the principles of classification which have guided us in our preliminary attempts to group the streptococci according to their chemical properties.

Turning now to the 1200 or so specimens of streptococci which have been tabulated from all sources, saprophytes and parasites together, they may be roughly grouped as follows.

A. The saprophytic group above mentioned which seems derived from the herbivorous intestine and may be termed "*streptococcus equinus.*" Its characters have already been sufficiently described; so far as is known it is totally devoid of pathogenic properties. There are records of 152 specimens conforming to the main types (i.e., fermenting only saccharose and the glucosides), derived chiefly from air, dust, and horse-dung, but including 17 from human saliva, 23 from human fæces, and one from urine. The variants which in addition give reactions with raffinose and inulin number 95 specimens (45 from air and dust, and 50 from human fæces and saliva). Variants giving also a neutral red reaction number 29 specimens.

B. The second group is still essentially saprophytic, occurring chiefly in human saliva and fæces, but is occasionally associated with disease. It is a short-chained form capable of good growth on gelatin at 20° C., and it gives a marked acid reaction in milk, though no clotting. Further, it almost always ferments lactose. These characters fail to separate it very clearly from Type A, but they do not sharply define it from Type C, the true streptococcus pyogenes. The only reasons which induce us to separate Types B and C are that Type B is habitually short-chained and non-pathogenic, and never associated with suppuration, while Type C is habitually long-chained, virulent, and typically associated with suppurative processes, being found only occasionally as a saprophyte. These differences are vague, and we are inclined to regard Type C as a parasitic form which has been evolved from Type B and is not yet sharply separated from it. Type B has been found with almost equal frequency in saliva and in the intestinal contents. In 132 specimens it has only nine times been found associated with disease processes and only once or twice has there been reason for regarding it as truly pathogenic. Such forms may with fair propriety be regarded as variants of Type D in which the power of clotting milk has been suppressed. Some name must for convenience be given to this type and we would suggest "*streptococcus mitis*" as a non-committal term fairly expressing its habitually non-virulent character. It may be defined as a short-chained form, almost never pathogenic, inhabiting the human alimentary canal, growing well on gelatin at 20° C., not clotting milk but often reducing neutral red. Its typical positive reactions with Gordon's tests are saccharose and lactose with or without the glucosides. 58 specimens are recorded as of this type; raffinose or inulin reactions were also present in 10 further specimens and reduction of neutral red in 64 more. This saprophytic type is of chief interest as the probable form from which the virulent streptococcus pyogenes has arisen.

C. The third group is one of the utmost importance in human pathology, having as its type the classical organism first described by Fehleisen as "streptococcus erysipelatos," but since more generally known by Rosenbach's name, "*streptococcus pyogenes.*" We adhere to the latter term because, though Fehleisen's name has undoubted priority, this species does so much more than produce erysipelas that the wider term deserves to supplant the narrower. This type has assumed more definitely parasitic characters than any other sort of streptococcus and in its fully-developed form seems not to occur as a human saprophyte, though some of its variants have been met with in saliva and fæces. Its characters are as follows. It is a long-chained form usually growing in woolly masses at the bottom of a clear broth; occasionally the broth is somewhat turbid and the chains of only medium length. It grows vigorously on gelatin at 20° C. It is actively hæmolytic but does not form H_2S in broth culture. It strongly acidifies milk but never clots it, nor does it reduce neutral red (those allied forms which do so we refer to Type D; they commonly show other differential characters in addition). The usual positive reactions with Gordon's tests are saccharose, lactose, and salicin, but a variant lacking the salicin reaction is quite common. It is highly pathogenic for the mouse and rabbit, somewhat less so for the guinea-pig, though it often produces a local suppuration in this animal. When freshly isolated from a case of human disease it generally produces a fatal septicæmia in the mouse in two or three days. In its commonest form, giving reactions with saccharose, lactose, and salicin, it has been met with 33 times in human disease and five times doubtfully associated with disease processes, but never as a saprophyte except as a short-chained form (Type B). In one case, of a child suffering from an acute and rapidly fatal pharyngitis, an organism was obtained from the tonsil in almost pure culture which in all respects resembled the classical streptococcus pyogenes, save that it rapidly liquefied gelatin.

Any one of the three cardinal reactions may be suppressed, giving variants which we shall describe later in detail. Further, certain reactions may be added, notably mannite or coniferin, without any other change in the general characters of the type. (Variants also occur in which raffinose and inulin reactions are added, but we have some grounds for regarding these as modifications of Type D in which the power of clotting milk has become suppressed.) The variants by suppression and by addition of mannite and coniferin account for 38 cases in which the organism was definitely pathogenic and 15 in which it was otherwise associated with disease processes. 15 such variants are recorded from normal saliva and fæces.

D. There is a form of streptococcus so characteristic of saliva, though it is also common in the intestine, that the term "*streptococcus salivarius*" may justly be applied to it. It is the form often spoken of as streptococcus brevis of the mouth, but so many other forms are also short-chained that some more distinctive appellation is needed. No less than 211 out of the 300 salivary streptococci studied by Gordon fall under the possible variants of this type and 105 out of Houston's 300 fæcal streptococci (i.e., it is proportionately twice as common in the mouth as in the intestine). Its variants pass by insensible gradations into those of the commonest intestinal form (Type F) which we describe as "streptococcus fæcalis," and we are unable to draw any absolute distinction between the two forms. Streptococcus salivarius, even in its short-chained form, plays no unimportant part in human pathology, and we have it recorded as pathogenic in 26 cases. But it appears to bear the same relation to the much more pathogenic long-chained form which we describe as Type E, that streptococcus mitis does to streptococcus pyogenes. There seems to be no distinction between them other than that the long chained forms are more highly pathogenic. Type E is really a parasitic form of Type D, but it is found much more frequently than streptococcus pyogenes as a saprophyte of the normal alimentary canal of man and animals.

The typical characters of streptococcus salivarius are as follows. It is a short-chained form which usually renders broth uniformly turbid, though sometimes the broth is clear with a deposit of short chains. It grows less constantly than Types B and C upon gelatin at 20° C. Sometimes it will grow, but often not. It clots milk almost always and in its typical form reduces neutral red, though variants occur which fail to do this. The characteristic fermentation

reactions are saccharose, lactose, and raffinose, the last-named less constantly than the first two. The glucoside reactions may be added, and rarely inulin.

Streptococcus salivarius is related in many ways to the pneumococci, which may prove to be a pathogenic offshoot from it. It is possible that some of Gordon's specimens from saliva were really pneumococci, but he paid no attention to the question of capsules. Streptococcus salivarius, however, is certainly not identical with the pneumococcus, being for the most part non-pathogenic; the pneumococcus, moreover, very rarely reduces neutral red.

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THE PULSE IN AORTIC DISEASE; THE RELATION OF PULSE CURVES TO BLOOD PRESSURE.

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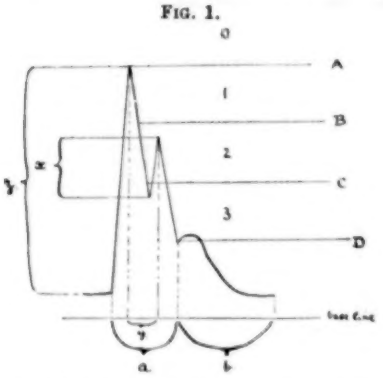
An analysis of the pulse curves of 20 cases of aortic regurgitation.—Careful notes were taken of 20 cases of aortic insufficiency. The cases were not selected, but were taken in rotation as they were admitted to hospital. They were examined and the pulse tracings were taken in the majority of cases within two days of admission, when the patients were settled, but before they were under the influence of drugs other than diuretics and purgatives. Most of the physical signs were checked by competent observers; the blood pressures given are average pressures of six or more observations taken for the most part between the hours of 10 A.M. and 12 noon, and at the same time as the tracings. The figures of the pulse analysis are the result of careful measurements and are each an average of five or more analyses from one or more tracings from each radial artery. The chief clinical features are given on the left of the accompanying table. It will be seen that in the majority of the cases they were those of considerable aortic incompetence, that two cases associated had mitral stenosis, and that ten others had mitral regurgitation to a lesser or greater extent. Cases presenting marked signs of aortic stenosis do not occur in the list. Some, no doubt, had a certain degree of stenosis but in no case did the physical signs indicate that it was a prominent feature of the case. Post-mortem examinations were obtained in Cases 6 and 17. Certain lettering and figuring in the table require explanation. Under "sclerosis of arteries," the signs, 0, S, S +, and S + +, indicate normal, slightly sclerosed, sclerosed, and extremely sclerosed vessels respectively. Under "pulsus bisferiens" + signifies its recognition by palpation, @ indicates its presence in marked degree. Under the instrumental analysis the description is divided into systolic and diastolic phases. Referring to Fig. 1, the intervals *a* and

FIG. 1.



b are the lengths of systolic and diastolic phases respectively. The "depth of the first notch," *x*, is given in its relation to the height of the primary wave *z*. The "second peak position" is given in the table, according to the position of its apex in relation to the equidistant lines A, B, C, and D, where A is drawn through the apex of the primary wave and D through the bottom of the dicrotic notch. In the figure given it falls in the position 2. When the apex falls in the position 0 the pulse is anacrotic. When it falls on one of the lines A, B, C, or D it is indicated thus, $\frac{1}{2}$ or $\frac{3}{4}$. The distance separating primary and first secondary wave is given as the distance *y*, in seconds.

The chief points of interest in the table are as follows: 1. 14 cases, of an average age 36·8 years, showed an average systolic blood pressure of 132 mm. Hg (cp. Janeway, p. 195). These were cases unassociated with signs of granular kidney. 2. Four cases, with signs of chronic interstitial nephritis and of average age 46 years, showed an average systolic blood pressure of 163 mm. Hg (cp. Janeway, pp. 195 and 169). 3. There was no definite relationship between the height of blood pressure and the amount of arterio-sclerosis (cp. Janeway, p. 185). 4. There was no relationship between the height of blood pressure and the state of compensation (cp. Janeway, p. 199). 5. There were, as would be expected, definite relationships between the amount of sclerosis and the age of the individual and etiology of the case. (Rr = recent rheumatism, So = syphilis of old standing.) 6. With careful palpation a pulsus bisferiens was palpable in 13 cases out of 20, and easily palpable in three cases. It was not palpable where the interval between primary and first secondary waves was less than one-tenth of a second, and not palpable when this interval exceeded one tenth of a second, if the depth of the first notch was limited. 7. There was a definite relationship between the height of the first secondary wave and the amount of arterio-sclerosis. The greater the sclerosis the higher the wave. There was no relationship between the height of the wave and the height of blood pressure and state of compensation. (When the wave occupied position 0 or 1 the pulse felt flat topped; when it occupied position 3 it felt collapsing.) 8. As a rule, though not invariably, the better the compensation the closer were the primary and first secondary wave, and the more shallow was the bisferiens notch (cp. Steell). 9. The average duration of systole[1] was 0·38 second, the average duration of diastole was 0·48 second; there was no definite relationship between the two and the relationship was of no prognostic significance (cp. Chapman and Allbutt). 10. A dicrotic notch was present in all cases; in nine cases it appeared normal, in six cases exaggerated, in five cases diminished. In height it showed no definite relationship to the amount of regurgitation (Case 17 in particular), to the height of blood pressure, to the amount of arterio-sclerosis, or the degree of compensation. Neither did it demonstrate any relation to the length of systole, but there was some relation between it and the depth of the bisferiens notch, though this was not constant. 11. In 18 out of 20 cases the two pulse tracings were identical. Of the remaining two, one (Case 6) showed a more prominent pulsus bisferiens on the left side; the other (Case 15) showed it more prominently on the right.[2] 12. One case out of 20 showed an anacrotic pulse (Case 2), but only on admission, and on admission compensation was poor; the patient's age was 68 years and he presented signs of extreme arterio-sclerosis and granular kidney.

Types of pulse curves in aortic disease.—The types of tracing met with in aortic stenosis have been fully discussed by many writers, notably by Marey, Mahomed, and Steell. Originally anacrotism was considered to be pathognomonic of the condition; later this type was found in association with numerous other conditions. The pulsus bisferiens was also found in stenotic cases. More observations led to the conclusion that neither type is pathognomonic, for both may be found apart from stenosis (cp. Steell, &c.). The more recent observers associate anacrotism, combined with low blood pressure, with marked stenosis, and this combination has been confirmed in these investigations by two cases in which the signs were definite; the blood pressures were 110 and 115 respectively.

Sansom describes three types of curve met with in cases of regurgitation: (1) curves with large amplitude of upstroke, usually having the dicrotic small and situated low down; (2) anacrotic types, associated with stenosis or renal disease; and (3) normal tracings. The second, he states, is of unfavourable prognostic significance, the third of good. It is impossible to divide, and indeed it appears inadvisable to attempt to divide, the types into classes. Every intermediate type exists and every combination of them. It seems better to describe the main features of these curves and the conclusions which can be drawn from them. In a paper by Galabin on the "water-hammer" pulse emphasis

[1] It must not be forgotten that this figure does not include the presphygmic interval (cp. Keyt).

[2] W. Broadbent attempted to show that these differences on the two sides are due to the arrangement of the aorta and its branches; in his experience the pulsus bisferiens is generally more marked on the one side. This is not the experience of other writers. Morison attributes the difference to a difference in longitudinal tension in the vessel investigated, due to the position of the limb. The view is not confirmed by these investigations, though it is true that the pulsus bisferiens is better marked with the wrist extended. (Cp. Lewis, Practitioner, 1906.

Case.	Sex and age.	Etiology.	H.A.B.			Epigastric pulsation.	Sclerosis of arteries.	Kidneys.	Blood pressure.	Aortic signs.					Mitral murmurs.	Compensation.	Palpation.		Instrumental.						
			Rib space.	Inches from mid line.	Character.					Basal murmurs.	Second sound.	Duroisiez murmur.	Thrill.	Aneurysm.			Water-hammer.	Pulsus bisferiens.	Arterial systole.				Arterial diastole.		Difference in right and left pulse.
																			Upstroke, sudden or normal.	Second peak position, 0, 1, 2, 3.	Distance between first and second wave in seconds.	Depth of first notch.	Length of systole in seconds.	Length of diastole in seconds.	Amount of dicrotic.	
1	F., 64	?	6	5½	Heaving	+	S+	*Nil.*	135	D.	0	0	0	+	*Nil.*	Good.	+	+	S	1	0·14	1/8	0·46	0·48	N	Identical.
2	M., 68	So	5	5½	Forcible.	+	S++	Alb. Poly. U	150	S.D.	0	+ Cap. pulse.	0	0	S slight.	Fair.	+	+	S	(0 on admission) 1	0·14	1/5	0·46	1·2	N	,,
3	M., 29	S & R	5	3	Indistinct.	+	S	*Nil.*	130	S.D.	0	+ Cap. pulse.	0	0	S	Poor.	+	0	S	2	0·14	1/10	0·42	0·33	–	,,
4	M., 40	So ?	6	6	Wavy.		S+	Alb. Poly. U.	165	S.D.	0	0	0	0	*Nil.*	,,	+	?	S	2	0·18	1/5	0·41	0·41	N	,,
5	F., 26	Rr	5	6	Forcible.	+	S	*Nil.*	130	S.D.	0	+ Cap. pulse.	0	0	S	,,	+	+	S	2·3	0·18	1/6	0·42	0·48	+	,,
6	M., 56	Strain?	5-7	6	Wavy but strong.	+	S+	,,	130	D.	0	+ Cap. pulse.	0	0	S	Bad.	+	?	S	L. 1, R. 2	0·24	1/3	0·42	0·33	+	Pulsus bisferiens more marked on left side.
7	M., 57	So	5	4½	Heaving.	+	S++	,,	135	S.D.	Present.	+ Cap. pulse.	0	0	*Nil.*	Good.	+	0	S	1	0·14	1/15	0·33	0·52	N	Identical.
8	M., 50	So	8	6½	,,	+	S+	,,	140	S.D.	0	+ Cap. pulse.	0	?	S	Poor.	+	0	S	1	0·09	1/8	0·18	0·29	–	,,
9	M., 51	Ro	6	4	,,	0	S+	?	?	S.D.	0	+ Cap. pulse.	0	?	*Nil.*	Fair.	+	0	S	1	0·09	1/8	0·24	0·52	N	,,
10	M., 51	S & Ro	6-7	6	Forcible	+	S+	Alb. Poly. U.	180	S.D.	0	+ Cap. pulse.	0	?	S slight.	Poor.	+	+	S	1	0·14	1/10	0·52	0·58	Very slight	,,
11	F., 11	Rr	7	6	Heaving.	+	0	*Nil.*	130	S.D.	0	0 Cap. pulse.	0	0	D. & S.	Good.	+	+	S	3	0·14	1/10	0·37	0·33	N	,,
12	M., 21	Rr	6	6	Feeble.	0	0	,,	130	S.D.	0	+ Cap. pulse.	0	0	S	Poor.	+	?	S	3	0·18	1/5	0·38	0·46	N	,,
13	M., 50	Ro	4-7	7	Wavy.	+	S	,,	135	S.D.	0	+ Cap. pulse	0	0	D. & S.	,,	+	+	S	2	0·14	1/5	0·37	0·46	+	,,
14	M., 26	So	6-7	5	Forcible.	+	S+	Alb. Poly. U.	160	S.D.	0	0 Cap. pulse.	0	0	S	Fair.	+	+	S	2	0·14	1/10	0·42	0·62	–	,,
15	M., 48	? injury.	5	4	Heaving	+	S+	?	?	S.D.	0	0 Cap. pulse.	0	?	S	,,	+	+	S	2	0·14	1/5	0·36	0·33	+	Pulsus bisferiens more marked on right side.
16	M., 28	?	5	4	Heaving	0	S	*Nil.*	130	S.D.	Present.	0	0	?	*Nil.*	,,	0	0	N	2	0·14	1/6	0·27	0·46	+	Identical.
17	F., 37	R Malignant.	5	4½	Feeble.	0	S	,,	140	S.D.	0	0 Cap. pulse.	0	0	,,	Bad.	+	+	S	2	0·18	1/6	0·37	0·42	+	,,
18	M., 14	R	5	4	Heaving.	0	0	,,	115	S.D.	0	0 Cap. pulse.	0	0	S. & (?) D.	Good.	+	0	S	3	0·14	1/10	0·38	0·24	N	,,
19	M., 61	Ro	7	6	,,	+	S		140	S.D.	0	0	0	0	*Nil.*	Fair.	+	+	S	2	0·14	1/4	0·42	0·62	N	,,
20	M., 30	Ro	6	5	,,	0	S	,,	130	S.D.	0	0 Cap. pulse.	0	0	S slight.	Good.	+	0	S	3	0·09	1/20	0·36	0·58	–	,,

REMARKS.

CASE 2.—Pulse anacrotic on admission; lost this character in two days.

CASE 4.—Some doubt as to condition of this man's kidneys.

CASE 5.—? Mitral stenosis also.

CASE 6.—Post mortem heart weighed 32 ounces; aorta dilated; muscle substance firm; aorta, chiefly regurg.

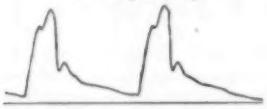
CASE 8.—Died shortly after leaving hospital. No necropsy.

CASE 17.—Necropsy. Malignant endocarditis. No trace of aortic valves. Heart weighed 18 ounces.

CASE 18.—? Mitral stenosis also.

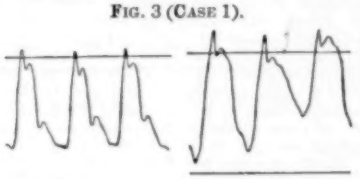
was laid on the abrupt primary upstroke (cp. Corrigan). It was shown by him that this feature is the most constant in curves of aortic incompetence and it is referred to by all writers. The abruptness of the upstroke is due to the sudden change from a low diastolic to a high systolic pressure, but it is probable that this character is present in many other conditions, notably high tension of cardiac origin with rapid outflow. Anacrotism has been mentioned already; apart from stenosis it is not commonly met with in aortic disease. In the one case (No. 2) of the 20 tabulated it was only temporary and associated with poor compensation, high blood pressure, and granular kidney (Fig. 2). It was also a

FIG. 2 (CASE 2).



feature in the tracings of Case 13 on his second admission, but was present for one day only. The evidence is consequently in support of Sansom's view that it is a sign of failing compensation and has a bad prognostic significance. The height of the first secondary wave has been shown to depend on the condition of the vessel wall. For this reason the anacrotic type should be found where sclerosis is marked (as in Case 2). Four tracings (Figs. 2, 3, 6, and 8) are given,

FIG. 3 (CASE 1).



illustrating the height of the second wave, and two others (Figs. 5 and 7) illustrating varying depth of the bisferiens notch. Tracings shown in Figs. 5 and 8 are from the same patient; the type shown in Fig. 5 remained for two days only, during which period the patient showed some heart irregularity.

In Fig. 3 a tracing from a thoracic aneurysm (of Case 1) is given (to the right); that to the left is from the radial. The change in the type of pulse during transmission is very slight. In Fig. 4 (Case 2) a very flat-topped type is shown, with the corresponding cardiogram to the right; the change in type during transmission is in this case remarkably small. Pulses of this type never feel collapsing to the finger, though they may be empty between the beats. A collapsing water-hammer pulse is shown in Fig. 8.

In the 20 cases referred to a somewhat inconstant relationship was found between the length of interval between the first and second waves and the prognosis. From these

FIG. 4 (CASE 2).

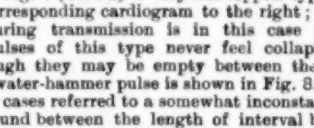


FIG. 5 (CASE 12).

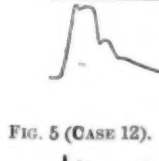
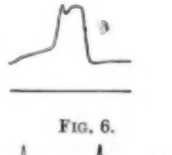


FIG. 6.



20 cases and numerous other cases investigated I am inclined to associate the length of this interval with dilatation of the heart; it has never been found of any great length, except in patients with very large hearts (Fig. 7 is from Case 6 and Fig. 5 from Case 12.) As a rule, it is associated with depth of the bisferiens notch but by no means invariably (Fig. 8). The subject will be referred to later at greater length. The prominence of the dicrotic in the 20 cases investigated is not in accord with the views of earlier writers (cp. Broadbent, Steell, Mahomed, &c.). A partial explanation of this may be due to the fact that the tracings upon which these observations were made were taken at light pressures, for a heavy pressure tends to obliterate the dicrotic or to place it low in the tracing in these cases. It is probable that the dicrotic is present to a normal extent in most aortic cases and it would appear, contrary to the opinion of most writers, that it is of little value

FIG. 7 (CASE 6).

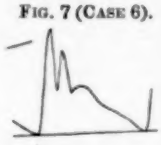
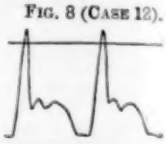


FIG. 8 (CASE 12).



in estimating the amount of the regurgitation or the nature of the aortic lesions. That dicrotism depends to some extent on rebound from the aortic valves may be admitted, but, as has been pointed out by Sanderson, Sansom, Galabin, and others, it may be marked where there is free regurgitation (cp. Lewis, *Journal of Physiology* 1906). If further proof of this is required it is to be found in Fig. 10. The dicrotic is well marked, yet post mortem no trace of aortic valves could be found; the case (No. 17) was one of malignant endocarditis. It has been suggested by Galabin that the rebound may in these cases take place from the blood entering the ventricle from the auricle. This is possible, but given a negative pressure in the ventricle during diastole it is somewhat difficult to realise. Moreover, a greater delay might be expected in its appearance at the wrist. By the side of this tracing is another (Fig. 9), showing a feeble dicrotic in a case (No. 10) of free regurgitation.

FIG. 9 (CASE 10).

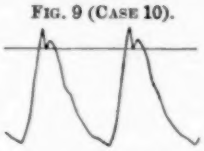
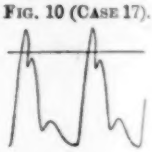
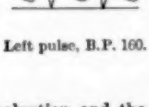


FIG. 10 (CASE 17).



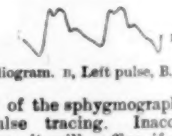
The relation of the height of the first secondary wave to the height of blood pressure.—The difficulty of estimating the height of systolic blood pressure by palpation has only recently been recognised, with the advent of the later and more accurate instruments devised for this purpose.[3] Many prominent writers on the subject of pulse tracings, notably Mahomed, insisted that there is a definite relationship between the height of the first secondary wave and the blood pressure; he estimated it by drawing a line from the apex of the primary wave to the base of the dicrotic notch. He stated that if the first secondary wave was raised above this line abnormal arterial tension was indicated. The methods employed for estimating tension

FIG. 11.



Left pulse, B.P. 160.

FIG. 12.



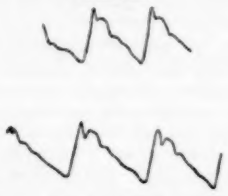
A, Cardiogram. B, Left pulse, B.P. 115.

were palpation and the pressure of the sphygmograph pad necessary to obliterate the pulse tracing. Inaccurate method never led to a greater error; it will suffice if a few tracings are given. The first (Fig. 12) a flat-topped pulse in a patient with systolic blood pressure of 115 mm. Hg, and another (Fig. 11) a collapsing pulse from a patient with a systolic pressure of 160 mm. Hg. They are examples

[3] The instruments used in these investigations have been the Dudgeon sphygmograph and C. J. Martin's modified Riva-Rocci sphygmomanometer.

of over 20 observations on each of these patients. In the table of aortic cases there is evidence to show this absence of relation, and evidence showing the presence of a relation between arterio-sclerosis and the height of the secondary wave. The patient whose tracing is shown in Fig. 11 suffered from chronic emphysema and presented little arterio-sclerosis. The subject of the tracing in Fig. 12 had marked sclerosis. The want of relation between arterial disease and high blood pressure has already been referred to. The general fall of the writing style from the apex of the pulse curve depends on two factors—the condition of the arterial wall and the rate of outflow. The two

FIG. 13.



tracings shown in Fig. 13 were taken from cases of generalised arterio-sclerosis, the first with a blood pressure of 130 millimetres, the second associated with granular kidney and a pressure of 250 millimetres—yet the two tracings are practically identical.

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Taff's Well, Cardiff.

THE RASH IN CEREBRO-SPINAL MENINGITIS.

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IN only a few of the numerous cases of the above disease which have occurred in Glasgow since the first quarter of the year has a rash appeared. This is in accordance with the reports of similar epidemics from various quarters in Britain. Herpes has been noticed in several and is usually situated at the angles of the mouth. But it is in regard to those cases in which a definite rash has appeared on the body before death that I desire to call attention. In two a decided purpuric rash, purple in colour and hæmorrhagic in character as spots, with well-demarcated edges, varying in size from a pin head to rather smaller than a lentil, were seen closely packed on the dorsum of the feet and nowhere else on the body. In another in which death took place within 16 hours from the time of onset (the first symptom being that of delirium, the child waking at 4 A.M. in this condition) a well-marked punctate hæmorrhagic rash, each spot singly of the size of a pin head, and in places in clusters of six or seven, was seen scattered all over the trunk and limbs. In another in which death took place after 24 days' illness a rash appeared on the seventh day and from the subsequent history evidently came in crops. On examination on the twenty-first day of the illness, purple and maroon spots, circular, with regular edges all the same size—i.e., that of a lentil—were seen on the dorsum of the feet, on the arms, the legs, the trunk (back and front), four below the chin, and one behind each ear. They were scattered over the body with areas of three to four inches of normal skin between each. These spots were definitely hæmorrhagic in character and so well defined as to be seen from a considerable distance, the picture presenting quite the aspect of "spotted fever." A cluster of 15 maroon spots occupied the interscapular space and appeared on the previous day. On visiting the case the following day those spots previously maroon had changed to purple, were still of the same size, circular with regular edges, but now quite purple. Next day—i.e., the twenty-third day of the illness—they had almost disappeared and fresh maroon ones were seen in other situations. Larger pale-blue blotches with irregular edges fading into the surrounding tissues, 16 in number, were also noticed on the trunk and limbs. They occupied the cutis vera, normal skin could be seen distinctly over them, and at no time was any alteration in their colour, appearance, or position noted.

Glasgow.

A NEW METHOD OF ADMINISTERING AN ANÆSTHETIC THROUGH A TRACHEOTOMY TUBE.

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THOSE of us who are called upon to administer an anæsthetic to a patient through a tracheotomy tube, whether the operation be for laryngotomy, thyrotomy, or other operation requiring a preliminary tracheotomy, have usually adopted one or other of the following methods—namely, a small catheter attached to a Junker's apparatus, a flexible tube and funnel (Hahn's), or a Skinner's mask held over the tracheotomy tube at a suitable distance. The objection to the first two methods is that they tend more or less to obstruct the already diminished air-way, which is one of the great difficulties in the way of administering an anæsthetic in these cases. The presence of a tracheotomy tube in the trachea is already a narrowing of the passage; if anything further, as a catheter, be introduced into this it means a further narrowing; or should respiration be carried on through a long tube the case is even worse—and add to this the deleterious effect of chloroform on respiration and the danger to the patient becomes enormously increased. With regard to the Skinner's mask, the size of the thing itself and the hand of the anæsthetist, taken in conjunction with the smallness of the field for operation, must hamper the movements of the surgeon considerably. Even in the Trendelenburg position the gain in room is not sufficient entirely to counteract these objections. With respect to charging up a patient with chloroform in these cases, to my mind it is a practice to be condemned as fraught with much danger; besides, the patient keeps coming round, often at inconvenient times for the surgeon. With a view to overcoming these difficulties I have had an instrument made for me by Messrs. Hockin, Wilson, and Co. The total length of the instrument is about 15 inches and it is composed of a handle, F G, and a long arm, F E D C B to A. The latter is of flexible

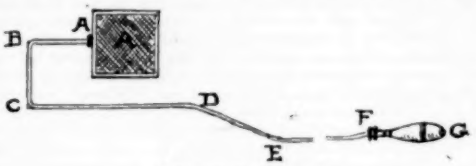


Diagram of Inhaler.

metal from D to A and is bent as illustrated. A is a one and a half inches square frame, which is to be covered with lint held in position by a safety-pin or stitching.

To use the instrument a piece of lint or similar material is stretched across the square A so as to cover it above and below and held in place by means of a safety-pin. Chloroform or C.E. is sprinkled on this from a drop-bottle and the part B C is rested on the sternum of the patient, so that A is above the tracheotomy tube. The limb C D to E is so bent as to bring the point E well down towards the operation table out of the way of the surgeon; E F gradually sloping up and bringing G to about the level of the patient's ear. The length of the instrument enables the anæsthetist to stand well back while using it. The square A

can be raised or lowered over the tracheal opening in two ways—first, as the metal at B is flexible it should be bent up to an angle of about 30°; and secondly, using C B resting on the sternum as a fulcrum by merely raising or lowering the handle F G the distance of A above the tracheotomy tube can be easily adjusted from time to time, to whatever extent desired, according as less or more chloroform is to be given.

In order to replenish the anæsthetic it can either be sprinkled on the lint while *in situ* from a drop-bottle or the whole instrument can be withdrawn sideways for the purpose without trouble. The double lint on the square frame takes a good charge of the anæsthetic and being double and sloping downwards towards the sternum the liquid does not tend to drop on to the tracheal opening should too much accidentally run out. By this method the air-way is not encumbered and feathers can be passed into the tube at any time.

I will quote a case in which I used a model of this instrument and where, I am sure, the patient could never have stood a catheter or tube introduced into the tracheal opening.

The patient, a boy, aged two and a half years, had total occlusion of the larynx due to papillomata, and was sent to hospital for operation. A tracheotomy had been performed some time previously, and through this opening the child breathed fairly well, but the pulse intermitted about every third beat. I anæsthetised the patient with chloroform in the first instance—he appeared to take it well. However, just before the operation was begun the breathing became bad, so I changed to ether, and as it improved to C.E., gradually increasing chloroform until finally anæsthesia was maintained by chloroform alone—using the same instrument throughout. The first incision was made during the C.E administration and the operation was proceeded with. It was curious to note how as the patient took more and more of the anæsthetic he became inured to it, for after half an hour he took pure chloroform without any unfavourable effect whatever either on respiration or the heart; he breathed freely, kept quite warm, and the face was a good colour all the time. Altogether he was under the anæsthetic three and a quarter hours, six drachms of chloroform being used and about three ounces of ether. There was no interruption of any kind during the operation. By adopting this method the patient had the full benefit of the calibre of the tracheotomy tube as a medium for respiration. There was no resistance to expiration; the miniature mask is not cup-shaped but perfectly flat and was never nearer to the tracheal opening when charged with chloroform than about one and a half inches, thus allowing a good outlet during expiration—which is, I think, of more importance than is generally supposed—as well as allowing a desirable proportion of air to mix with the anæsthetic prior to inhalation.

Should the operator and his assistants desire to take full possession of the head and neck of the patient and the anæsthetist, having put the patient under, be required for this purpose to continue the anæsthetic from the other end of the couch, this can be easily accomplished by inverting the instrument and extending the frame carrying the lint about 150°. By this means, and still resting B C—which for simplicity I may call the cross-bar or sternum piece of the instrument—on the sternum, the whole can be manipulated in precisely the same manner as before—that is to say, by raising or lowering the handle the mask is lowered or raised at will. In the case I have just quoted it was not necessary to adopt this course, as when the surgeon wanted to work from above or to obtain a good view downwards from the head to the larynx it was possible for him to obtain his wishes during a brief interval in which the anæsthetic was suspended.

One word of warning is perhaps necessary in the use of this instrument, and it is that while the surgeon is engrossed in his work he may inadvertently rest his arm on the lint-covered frame and press it down over the tracheotomy tube, but this can easily be guarded against by observing when he is going to adopt that position and moving the instrument out of his way for the time.

The advantages to be derived from this method may be summarised as follows: (1) It administers chloroform or C.E. efficiently; (2) practically it does not interfere with the surgeon at all; (3) it gives the surgeon the maximum space possible; (4) it is much safer than a tube and funnel or catheter and Junker arrangement, and it is not so cumbersome and obtrusive as a Skinner's mask; (5) it is cheap, durable, and easily sterilised; (6) it is flexible and can be accommodated to any position to regulate the quantity of anæsthetic given; (7) in case of necessity it will administer ether alone as a stimulant; and (8) it can be used from any position to suit the surgeon.

Ealing, W.

ANKYLOSTOME PARASITISM AMONG THE NATIVE LABOURERS IN THE TRANSVAAL.

BY W. G. TOTTENHAM POSNETT, F.R.C.S. IREL.,
HONORARY PATHOLOGIST TO THE JOHANNESBURG HOSPITAL.

WHILE acting as medical officer in charge of the Johannesburg Prison from March to August, 1904, I noticed that many of the natives under my care were suffering from anæmia, some to a slight degree, others showing marked blanching of the mucous membranes, though, like all natives, they did not report themselves sick until they were in a serious condition. One morning the head warder in charge of the native section of the gaol sent a "boy" up to the hospital as he seemed ill, and on my rounds I saw him and made the following note of his condition. He was a tall well-nourished "boy" (Shangaan). The mucous membranes were almost white, the respirations (while standing) were 29, the temperature was 97·4°F., and the pulse was 112. There was great cardiac distress, with diffuse præcordial pulsation. When asked where he was sick he pointed to his epigastrium. Suspecting ankylostomiasis, though never having heard that the disease occurred among the natives here, I examined a portion of his stool microscopically and found numerous eggs of the ankylostomum duodenale. Being very busy at the time I was unable to investigate the case further but the "boy" got quite well under the usual thymol treatment.

Since being appointed honorary pathologist on the staff of the Johannesburg Hospital I have had more opportunities of following up the idea that I had formed that the natives were extensively infected with ankylostomes. This surmise has been borne out by the investigation of some 40 specimens of the stools of natives admitted for various diseases to the native medical ward of the hospital. The "boys" from whom the specimens were obtained belong to the many and various tribes which inhabit South Africa, south of Rhodesia, and including Portuguese East Africa. Out of the 40 specimens of fæces subjected to microscopical observation 32 per cent. contained the ova of the ankylostome. None of these natives showed symptoms of ankylostomiasis. I noticed that the natives from Portuguese East Africa and the Shangaans from the low veldt were more frequently the hosts of the parasite than the members of other tribes. This parasite is therefore evidently widely distributed throughout the natives employed on the mines of the Witwatersrand and such being the case the economic importance of its recognition to the mining community of these fields cannot be passed over in a light manner. Although not as a rule, so far as I can find out, a direct cause of death among the natives of the mines its debilitating presence must be counted as a serious factor in the high death-rate prevailing among our native labourers. But the importance of this parasitic nematode worm being a very frequent inhabitant of the intestines of our coloured workmen does not end with the native—we have to think of our white miners as well.

From information imparted by old miners on the Rand it is evident that the sanitary conditions underground on the mines during the time of the South African Republic were in a most primitive condition, consequently the native evacuated his intestinal contents anywhere and everywhere in the workings, thus contaminating the ground with a most dangerously infective host of ova of the ankylostome. The white miner was far from innocent in the same respect. It is therefore a foregone conclusion that our white miners must be extensively infected by ankylostome parasites, and, although they may not show any symptoms of doing so, their working capacity and illness-resisting powers must be considerably reduced. Unfortunately, I am not in a position to be able to obtain the necessary material for a microscopical search of the white miners' intestinal parasites so as to prove the above assumption, but I do not doubt its correctness. In 1902 Haldane and Boycott were sent to investigate miners'

anæmia in Cornwall with the result of finding the ankylostome to be the cause. In 1899 the Boer war broke out and as a consequence thousands of Cornish miners and miners from other parts of England, Scotland, and Wales were forced to leave the Transvaal and return home until the end of hostilities. A large number of these men found work in the mines of the old country, and the assumption forces itself upon me that these miners, importing large numbers of ankylostome ova, must have been a large factor in increasing the infection already existing among their fellow workmen, hence the symptoms which called for the investigation conducted by Haldane and Boycott.

The disposal of sewage created by a community, a large proportion of which are hosts of the ankylostomum duodenale, must be carefully considered by those in charge of the health of the inhabitants of localities where such occurs. If sewage farming be adopted the dissemination of the infecting larva by means of lettuce, radishes, and other vegetables which are eaten in an uncooked condition is very liable to occur. The septic tank system commends itself to me as being that most likely to destroy the infecting agent, unless running the sewage out to sea be available. I believe it has fallen to my lot to be the first [1] to point out the existence of ankylostome infection among the natives of the Rand, but the more complete research into the infection of white miners I must leave to those whose opportunities, as medical officers of the various mines, are almost unlimited and whose time is not occupied by the uncertainties of general practice.

Johannesburg.

URINARY CALCULUS AND ITS DETECTION WITH THE X RAYS.

BY EDWARD W. H. SHENTON, M.R.C.S. ENG., L.R.C.P. LOND.,

RADIOGRAPHER TO GUY'S, ST. PETER'S, AND THE HAMPSTEAD GENERAL HOSPITALS.

I BELIEVE that there is a very general misconception with regard to the proper uses of the x rays in the detection of urinary calculus. This opinion has been forced upon me by the reading of the little literature there is on this subject, and by conversation with practitioners who are interested in the results but are not conversant with the means by which diagnosis is attained in renal radiography. To put the matter briefly, it is not recognised that there are two ways in which the rays may be used, first, for screen examination and, second, for photographic effect, and beyond question the *former* is the one of service in diagnosing lithiasis. I make this statement after a full and deliberate consideration of the subject for upwards of nine years. It is worthy of note that, whenever or wherever a surgeon reports a case in which the x rays have been used, he always says "the radiogram showed this or that" and never "the screen examination." It is not to be wondered, therefore, that one hears continually of the "deceptiveness of skiagrams" and "expert interpretations of radiograms," &c. For the last two years in my own practice I have used radiograms as the microscopist would use photography as a means of recording what has already been seen and as a reference when examining other cases.

There is little doubt that improvement in methods and apparatus is largely responsible for the better screening capabilities of the x rays but this does not tell the whole story. The active x rays—by which I mean the x rays as they illumine the screen—constitute a potent diagnostic instrument, and if we will concentrate our attention upon the shadows they throw of the living organs we can train ourselves to see much that will be of use to us as medical men. It has been truly said, "we see what we are taught to see," and the converse holds good in that if we are not shown a thing we do not see it, or at any rate are remarkably slow to appreciate its presence. It is only after watching a screen daily for many years that the x ray operator has at last had forced upon his notice facts that are of inestimable value to him as a diagnostician. The same may doubtlessly be said of many other forms of diagnosis; it must have surely been a long time before the first users of auscultation found out how to sift and classify the sounds they heard and knew which were normal and which were not. With the screen examination of other regions of the body save those containing the urinary organs we are not concerned in this article, but these regions, the abdomen and pelvis, must be specially considered. There is, I regret to say, a general tendency to invent complicated apparatus for obtaining abdominal skiagrams—machines that cut the current off during a portion of a breath, apparatus that exerts pressure on or around a kidney to hold it still, &c., and no extra care is being bestowed upon the obviously efficient and invaluable screen. If anyone will take a little trouble and study the screening method I am about to describe I feel convinced he will be surprised, firstly, at how little he can see; secondly, at how much, and what assurance he will feel as to the presence of a stone when once he has seen it *in situ* upon the screen, and not as a mere smudgy mark upon a dismal-looking radiogram. I would not do away with radiography, for by its means much useful and confirmatory evidence in urinary cases is forthcoming, but it should be clearly understood that because an object is not visible in a photograph it is not necessarily absent in the subject photographed—the skiagram may be too bad; or—and this also is very likely—it may be too good. It should be generally understood that if a skiagram, particularly of the lumbar regions, possesses great pictorial beauty, a clear spine with a few well-defined and clear-cut ribs, it is usually inadequate so far as diagnostic value is concerned. Pale stones, such as phosphatic calculi, and little stones will not appear, and to show these it is essential to get a dull grey image which, from a pictorial point of view, is unattractive. I am told by certain radiographers that surgeons will not receive these pictures but insist upon a bright cheerful skiagram which shows nothing useful, and to clinch the argument I have been shown splendid photographs taken by a local pharmaceutical chemist or instrument-maker showing a black well-defined calculus, and told that is how surgeons like their calculi shown. Now I venture to think that these radiographic experts are to blame for not properly enlightening the surgeon in this matter. It is not usual to blame the physician because a heart bruit is not as loud in one particular case as in another, and we do not usually suggest that if he cannot make this bruit louder we shall be forced to go elsewhere for our consultant. Is there, therefore, any more sense in blaming the radiographer because he only shows a faint shadow in a photograph when by its mere showing he can tell you three important facts—firstly, the presence of a stone; secondly, its quality; and thirdly, its anatomical position? Is it reasonable to hold up to him the record of a powerful x ray obstructing oxalate stone which no amount of skill would prevent from throwing its shadow on a photographic plate and which therefore is an ideal subject for the lay x rayist, and tell him that he must make all his uric acid stones appear the same? Then the surgeon will occasionally say: "I had a good x ray photograph taken of the patient but it showed no stone." Just so; and if he had had a good screen examination followed by what he would call a poor photograph he would have had much useful and sensible information which would have served him better than his stone-obliterating but pictorially excellent radiogram.

Another difficulty the surgeon unintentionally puts in the radiographer's path is the following. He must have a skiagram of large dimensions and the larger the area the more accuracy he imagines he is getting. In this matter he is totally wrong and if he would spare a little time and watch the effects of a contracting diaphragm on a given screen image he would quickly appreciate the fault. Increasing the size of a radiogram is like throwing extraneous light upon a magic lantern picture, the excellence of the latter being in inverse proportion to the quantity of extraneous light thrown. Or, to use a photographic simile, the difference between an unstopped and stopped lens is the difference in effect between the large radiogram and the small. Now, if we have a large radiogram of the abdominal region, including both kidneys, ribs, and crest of ilia, we succeed in excluding all but the most opaque and obtrusive stones, and a little experimenting with a few small calculi laid upon a patient under x ray examination will at once prove this fact. One striking case of this kind I might mention was when the open tube showed no calculus, a large diaphragm demonstrated a small elusive shadow in the left kidney region, and by contracting the diaphragm until it was only just larger than the little shadow a calculus was observed the outline of which was clean cut and clearly defined; the photograph which I took

[1] Transvaal Medical Journal, April 1st, 1906.

measures about one and a half inches square. "The smaller the diaphragm the better the skiagram," would be a true maxim if it were borne in mind that the actual image does not become smaller, and therefore the diaphragm must be sufficiently large to include the object examined. We have no method of reducing the size of our image as in photography, for the x rays cannot be refracted, reflected, or influenced in any such way. Now it would be very laborious and well-nigh impossible to take a quantity of little skiagrams about one and a half inches in diameter all over the urinary areas, and it is, therefore, to the screen that we must turn for assistance. In a screen examination it is possible to examine the patient in a series of small areas and in this lies one of the superiorities of screening over photography. Moreover, the amount of movement constantly present in the abdomen, whatever precautions are taken, such as holding the breath, fixing the kidney with compressors, &c., makes photography in small areas often of little use, whereas the slight movement upon the screen is a positive help in the detection of a foreign body.

It may be of interest to the reader if I give a brief description of the routine examination of a patient suspected of urinary calculus, the principle being one I have employed with more or less success in the examination of over 1600 cases. The source of light should be below and the screen above. This is effected by the patient lying on a table with a canvas top. He lies upon his face, for in this position the abdomen is reduced in antero-posterior measurement. The screen is placed upon his back. The tube from the first should be shaded by a diaphragm of some x ray opaque material —metal or a special kind of indiarubber. The opening in this diaphragm should not be more than four inches if variable or three inches if fixed and the tube is brought as close to the patient as is consistent with comfort. This will probably be three or four inches from the skin—if much nearer the high tension current is perceptible and causes more or less discomfort; it is not, however, painful or dangerous from this part of the tube. Now we come to an important consideration and that is the difficulty of seeing an image upon the screen through this thick part of the body. It is essential that the operator shall have been at least 15 minutes in the darkened room before he can fully appreciate the screen picture, and one has only to go into a dark room from bright daylight and wait to realise the enormous facility the eye has of adapting itself to varying degrees of illumination if given sufficient time, and how in a few minutes the apparently dark room becomes more and more a room of subdued light only. Coming from ordinary daylight to look at the screen in a quite dark room the operator's vision will slowly and steadily improve for quite 15 minutes. There is no doubt, however, that confinement in a dark room is very tedious and unattractive to a busy man and I have overcome this difficulty in the following manner. The screen image is, as most people are aware, yellow usually, but sometimes slightly greenish. I have therefore lighted the operating room with the complementary colour—in my own case a blue light, and this, though ample light for most purposes, leaves the retina immediately ready to receive the yellow screen light. I would particularly call attention to this matter as it has been a great comfort and for me an important feature in connexion with screen examination.

What one observes first of all upon the screen is a dim circle of light and this by suitable mechanism is adjusted in the middle line until the individual lumbar vertebræ are discernible. Then it is well to look for the transverse processes. If these are clearly seen the operator may feel assured that no calculus of reasonable size or of suitable chemical consistency will succeed in eluding detection. A diligent search is now commenced, by moving the tube over the renal areas, for any suspicious-looking body. It is curious how with practice a foreign object, such as a calculus, arrests the attention. Upon discerning the slightest suspicion of a foreign body the patient is told to take a deep breath. This is done for two reasons: first, a moving body is often easier to detect than one remaining stationary; and secondly, the relative movements of this object and surrounding organs bear an important relation to one another. For example, if, as is usually possible, one edge or part of the kidney is observable, note whether the movement of this and the foreign body are coincident. If they move as one the inference is in favour of the object being a stone in the kidney, and if the relative movements do not coincide it is extremely probable that the contrary is the case. Contract the diaphragm upon this suspicious object and try to make out its outline. Renal stones have often such characteristic shapes that this may be valuable evidence. Systematic search is made in this manner in renal, ureteric, and bladder regions, being careful to look up as high as the last two ribs, and while in this position make the patient breathe deeply, for I have several times in this manner driven a stone from its lurking place behind a rib. The kidney is a more moveable organ than is usually described and normally moves appreciably with respiration. When examining over the bladder region pressure on the screen should be made as this much improves the screen picture. In this region the sacrum must be remembered, but its extreme symmetry prevents it being mistaken for calculus material; also, in the event of finding calculus in this region remember the possibility of its being in the lower ends of the ureters. I have found calculi in both ureters at the same time and from the comparison of their appearances have been able to give their composition; in one case this was oxalate of lime in the right and phosphatic material in the left. The photographic plate will be useful at this stage, for, having caught the calculus in as small a circle of light as is desirable for good definition, the plate in its light-tight envelope is placed over this spot between the patient and the screen—the rays being turned on and the lights in the room being out—a few seconds only are necessary by way of exposure with any good make of modern tube properly treated. There is no doubt that the diaphragm tends to increase the exposure, and this fact must be borne in mind.

Practice in viewing the abdomen with a fairly large diaphragm—say four inches—will reveal many of the organs there contained. It is always desirable to have the intestines as empty of solids and as full of gas as possible. In this condition the whole length of the colon is clearly and brightly outlined and as a contrast to the thick tissue of the kidney is most valuable, as it is usually easy to see the outer borders of these organs against the lighter colon. Scybala may lead to erroneous conclusions and I must confess to twice being the cause of unnecessary operations by the deceptive appearance of the renal area. This is not likely to occur again, for there is a way in which it may be avoided, and that is by examining the patients on two occasions, when the intestinal matter will, at any rate, have altered its appearance even if it has not completely passed away by suitable treatment. It is distinctly advisable, though not always feasible, that every case of suspected calculus should be examined twice if an operation is to be based upon the results of the x ray examination. Scybala more often lie to the outer side of the kidney and their presence then must make the operator suspicious of others possibly nearer the middle line. By observing relative movements, as the patient breathes deeply, mistakes may also be avoided.

I need not go further into the technique, the above description is a sufficient outline. In speaking of the screen in the diagnosis of urinary calculus I am not putting forward an untried theory, but one which a very large series of cases has proved to be sound and practical. It has reduced the inaccuracies of this branch of radiography to a minimum, and where failures do occur they are usually traceable to inability to carry out the method I have described completely. In the work I have done for St. Peter's Hospital and which, owing to the kindness of Mr. S. Allen, I have been able to check as to accuracy, there has not been an x ray report that has been proved incorrect since this system of strict screen examination was substituted for the former photographic method.

I would earnestly beg those who would avail themselves of the x rays in cases of calculus to insist, even in acute cases, that the screen be used, and this can be done without much inconvenience to the patient—indeed, with infinitely less than that occasioned by the old unsatisfactory system of pushing a plate under him and placing the tube above. It is no exaggeration to say that this plan will fail in two-thirds of the cases examined.

Harley-street, W.

A MEDICAL TOWN COUNCILLOR.—Mr. H. F. Devis, L.R.C.P. Lond., M.R.C.S. Eng., was on Sept. 3rd returned at the head of the poll for the Somerset ward of the Bristol city council.

SOME OBSERVATIONS ON CONVULSIONS IN CHILDREN AND THEIR RELATION TO EPILEPSY.

BY R. O. MOON, M.D. OXON., M.R.C.P. LOND.,
PHYSICIAN TO THE WESTERN GENERAL DISPENSARY, MARYLEBONE, AND TO THE HOSPITAL FOR DISEASES OF THE HEART, SOHO-SQUARE, ETC.

THE great frequency of convulsions in children is a matter of common observation and as in other things familiarity breeds contempt, so here they are apt to be treated as of slight importance if gross lesions of the brain or toxæmic conditions such as uræmia can be excluded. While the immediate danger to a child from a convulsion may be slight and seem indeed to interfere but little with his ordinary health, the prognostic significance of such a symptom as to the future welfare of the child, especially his mental and moral condition, is far from being unimportant. Some time ago in these columns [1] I analysed the results of an investigation into a hundred cases of convulsions in children with a view to determine their relation to epilepsy and I now propose to examine a second hundred, many of which I have been able to observe owing to the kindness of Dr. F. J. Poynton who has allowed me to make use of some of the cases in his out-patient department at the Hospital for Sick Children, Great Ormond-street.

As in my former set of cases so in these I have not been able to find any clear dividing line between infantile convulsions or eclampsia on the one hand and idiopathic epilepsy on the other, nor could one say with Russell Reynolds that there is a sharp distinction between the two, that in fact "epilepsy should be regarded as an idiopathic disease, i.e. a morbus *per se*, which is to be distinguished from eccentric convulsions." On the contrary, it has seemed to me that convulsions in early life may shade off indefinitely into epilepsy or epileptiform manifestations, so that it becomes often impossible to say where the one stops and the other begins. Infantile convulsions do not, of course, necessarily pass on into epilepsy, but it certainly seems that a much larger number do so than is generally supposed and also that we have at present no adequate criteria for deciding in a given case in favour of the more or the less serious prognosis.

Etiology.—As in the previous series so here I have found in about half the cases that the first convulsion has arisen suddenly without any obvious cause, while the child has been in apparently good health, and it is to this kind of case that the name of idiopathic epilepsy is given; in the remainder the first convulsion has arisen in connexion with some extrinsic cause, such as teething, rickets, traumatism, specific fevers, indigestion, or indefinite conditions of ill-health. Among these reflex causes of convulsions rickets and teething stand out as certainly the most prominent, the former being responsible for 10 per cent. of the cases and the latter for 17 per cent.; in the former series this relationship also obtained. As to the association with specific fevers, one finds it difficult to believe that the occurrence is so frequent as text-books would seem to suggest. One can hardly believe that many observers would endorse the statement of Koplik [2] that "the majority of the convulsive seizures of infancy and childhood occur in connexion with the infectious diseases and at the onset of those affections." In my cases there were only three instances, two occurring prior to the onset of pneumonia and one in the course of pertussis. Speaking generally, it would seem to be true that in a child subject to fits the occurrence of a specific fever increases their frequency, and I would emphasise the fact that the same is true of adults when attacked by influenza. Still there are striking exceptions to this rule. Thus, a child who had been having convulsions about once a fortnight for six months was attacked by measles and then pertussis, during which time she had no fits and in fact remained free from them for six years. Another child who began to have fits for the first time at the age of six years with considerable frequency had in the preceding two years suffered from measles, scarlet fever, and pertussis without having had any epileptiform manifestation, which one might have expected to occur in such a case if the specific fevers were powerful agents in giving rise to convulsions. Heredity has been an important antecedent in 29 per cent. of the cases but the striking fact appears that a larger number of cases arising in association with reflex conditions owned a history of heredity than did those of idiopathic epilepsy.

Alcoholism.—A history of this was found in one or both parents in 10 per cent. of the patients and these were equally divided between both types of cases.

Prognosis.—Natural as it seems to suppose that the prognosis would be greatly better in cases originating in connexion with some peripheral irritation, where at all events there appears to be a chance of removing the cause, I have not found this borne out by facts. Thus of 50 cases of convulsions associated at their onset with some extrinsic cause such as I have enumerated above, in 40 per cent. the convulsions ceased after the removal of the apparent cause, while in 36 per cent. they continued; among the 50 cases arising from no apparent extrinsic cause, in 30 per cent. of cases they ceased while in 44 per cent. they continued. True, this shows a balance in favour of a more hopeful prognosis in the case of reflex convulsions, but the scale does not incline so heavily to that side as is usually supposed. The frequency of the fits is not, however, the most important matter in the prognosis. Epilepsy would not be so serious a disease if it were only the fits as such which had to be considered; unfortunately it is the mental and moral impairment of the patient which make the disease so universally dreaded. With regard to the question of mental impairment, we find that among those whose convulsions arose without any obvious cause 18 per cent. showed definite signs of mental weakness, while of those arising from reflex causes 23 per cent. suffered in this way. According to Savage "all epilepsy tends naturally to weak-mindedness, this depending rather upon the frequency of the fits than upon their severity, and epilepsy when occurring before seven years of age is certain to leave the patient weak-minded." We have not found the prognosis quite so bad as this, but doubtless had we been able to follow up cases much beyond the age of childhood we should have found a still larger percentage of cases that had been mentally weakened. Coming to the question of moral impairment, we again find a somewhat larger proportion of the cases due to reflex causes exhibiting moral deterioration than of the idiopathic cases; of the latter there were 34 per cent. and of the former 43 per cent. It is curious to note that a larger number of the children are affected prejudicially as to their general temper and character—that is, on the moral side—than as to their intellectual powers. Somewhat similarly it has been observed that in general paralysis of the insane it is the finer attributes of temper and character which begin to be blunted before the mental powers show definite impairment; possibly the former are flowers of more delicate growth so that very slight disturbances cause them to wither. Even after all convulsions and *petit mal* attacks have definitely ceased we often find manifestations of nervous instability which, though not epileptic, seem to have some affinity with epilepsy and might be called, to use Spratling's expression, "fragments of epilepsy." [3] Thus two of my cases after the cessation of convulsions suffered from enuresis, and a third from night terrors; in these the initial convulsions had occurred in connexion with rickets. We have similar instances in the case of those whose first fit was associated with teething. One patient after the cessation of the fits used to suffer periodically from a peculiar knocking sensation at the forehead, while another had occasionally temporary paresis of the right arm and leg, a third suffered from somnambulism, and in a fourth asthma occurred. Instances such as these seem to indicate that a radical unsoundness of the central nervous system is a more important factor in the production of infantile convulsions than an extrinsic cause.

Treatment.—I have little to add to my previous observations on this head. Urethane was tried in a few cases where other drugs had failed, and in three instances it certainly did good and I have not found that it has had any prejudicial effect on the general health. Spratling speaks of it as worthy of trial in cases in which the bromides give no benefit. Chloral is often useful as a temporary measure when the fits are very frequent and violent, but it is important to leave it off gradually, as when stopped

[1] THE LANCET, Dec. 24th, 1904, p. 1778.
[2] Koplik: Diseases of Infancy and Childhood, p. 473.
[3] Spratling: Treatment of Epilepsy.

abruptly it seems to make the child peculiarly restless and irritable. As to surgical operations, one case became distinctly worse after the removal of tonsils and adenoids, another was unaffected in any way by the same operation, while a third seemed to improve. One case suffering from rather bad phimosis showed no improvement as regards the convulsions after being circumcised.

Conclusion.—From what has been said it seems difficult to avoid the belief that convulsions in infancy associated with reflex causes have a much more serious prognostic signification than is usually supposed, not only as regards the frequency of the convulsions but still more as to the probability of future mental and moral deterioration. The reason why it has been customary to attach so much importance to convulsions of idiopathic origin is twofold: (1) the great *a priori* probability of such a view, and (2) the failure to follow up for any considerable length of time cases of convulsions associated with reflex causes. It is only the latter more humble task which I have been attempting here: at the same time, one might point out that the *a priori* reason is not so formidable as it seems. "Cessante causa, cessat et effectus" sounds very conclusive, but, of course, when we speak of rickets, teething, specific fevers, &c., being reflex causes, in strictness of logic they are merely antecedent (or concomitant) conditions, the cause being simply the totality of antecedents among which the intrinsic condition of the brain may possibly be the most important. One might also readily argue that a convulsion, to whatever cause it may be due, must have some effect upon the brain and that the nervous system very easily forms habits, so that the fact of having had one convulsion, however induced, renders it more liable to have another quite apart from any extrinsic cause. However this may be, the fact remains that in 200 cases taken haphazard, carefully investigated and followed up, the prognosis as to the future moral and mental condition of the child does not appear to be any better when the first fit is associated with a reflex cause which can be removed than when it is of idiopathic origin. It will, however, be necessary for our knowledge of the pathogenesis of epilepsy to be much further advanced than it is at present before its precise relationship to infantile convulsions can be determined.

Green-street, W.

THE PROPHYLACTIC USE OF ANTI-DIPHTHERITIC SERUM.

BY WILLIAM W. SHACKLETON, M.D. DUB.

THE following short account of the prophylactic use of anti-diphtheritic serum during an outbreak of diphtheria last autumn in a school containing over 300 boys may be of interest.

On Sept. 7th, 1905, two cases occurred in a junior house (which I will call E House) which had at the time 44 boys resident in it. From that time to the 13th four more cases occurred in this house and one in a senior house. In addition to these a boy in E house was removed and isolated on account of having a nasal discharge in which Klebs-Löffler bacillus was found; this boy was placed amongst the diphtheria cases and by douching a quantity of the membrane was removed from the nasal cavity. Out of 45 boys seven had developed diphtheria. I therefore on the 13th inoculated all the boys remaining (38) in House E with 2000 units of anti-diphtheritic serum supplied by Burroughs and Wellcome. The next morning (the 14th) one case occurred and after that not a single case occurred for five weeks in this house. I examined these boys' throats every day and took swabs therefrom. I found nine boys with the diphtheria bacillus present. These boys I isolated (not putting them, however, with the diphtheria cases) and kept them so until swabs were obtained free from the bacillus. The bacilli were persistently present in one boy's throat for five weeks, at the end of which period he developed small patches of membrane on each tonsil. He had been inoculated on the 13th with his house. This is interesting as tending to support the view generally held that the prophylactic effect of the serum lasts about five weeks.

On the 28th I saw a boy from a senior house who had well-marked membrane on the tonsils and soft palate. The diphtheria bacillus afterwards was proved to be present. He acknowledged that he had had a sore-throat for two or three days but had kept the fact to himself. I therefore examined all the school (317) and found two cases of diphtheria. On the following day, with the help of my colleague, Mr. G. Francis Smith, and Dr. J. H. Hebb, all the boys in the school (with the exception of E house previously done) were inoculated with 1000 units of anti-diphtheritic serum supplied by the Lister Institute. No more cases occurred amongst the senior boys.

In E house, which was the original focus of infection, one case occurred on Oct. 18th. This case was that of a boy who had come back on Oct. 14th and was not inoculated. He was the only boy in the whole school (except those who had actually developed diphtheria previously to the inoculations) who had not had a prophylactic dose of serum. Amongst the 317 healthy boys inoculated no ill-effects ensued. One boy was kept in bed two days as there was a good deal of pain and swelling in the region of the inoculation. No other boy was absent from the school or unable to play games. Many had slight urticarial rashes. I found that the least painful place to inject was the buttocks. The inoculation of this large number of boys was done in about two and a half hours, thanks to the able assistance of the staff. All that we had to do was to fill the syringes and inject. By having a good supply of needles a sterilised needle was always ready. The skin was previously well scrubbed with soap and antiseptic and covered with a moist dressing, gauze being strapped on immediately after the injection. On the 19th the boys of E house were for a second time inoculated with 1000 units of serum. This I did after the boy who had missed being inoculated developed diphtheria. A month had elapsed since the first inoculation.

To sum up. No case occurred amongst boys belonging to E house after the first inoculation for five weeks, except one, and that on the day following the injection. The case that did occur at the end of five weeks had the Klebs-Löffler bacillus present during the whole of that period. One other case occurred in E house but that was in the case of the only boy who had not received any serum. No case occurred amongst the senior boys after the injection, although three cases had occurred and these were freely mixing with their companions until detected and removed. That no cases did occur and escape detection I am pretty certain, as I made a daily inspection of all the boys' throats for a considerable time. I may add that all the 14 cases of diphtheria did well. With the one exception of the boy at large for two or three days all of them got inoculated within a few hours after the first symptoms of the disease had manifested themselves.

Bushey, Herts.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF FAUCIAL ANGINA WITH FALSE MEMBRANE (NON-DIPHTHERITIC) SIMULATING DIPHTHERIA.

BY J. T. C. NASH, M.D. EDIN., D.P.H. CANTAB.,

MEDICAL OFFICER OF HEALTH OF SOUTHEND-ON-SEA; MEDICAL SUPERINTENDENT OF SOUTHEND-ON-SEA BOROUGH SANATORIUM.

A WOMAN, aged 38 years, felt her throat uncomfortable on August 5th, 1906. She sought advice on the 6th, when the pharynx was found to be slightly congested and a thin film was observed on the tonsils which, however, were not noticeably enlarged. There was no nasal discharge nor were any glands unduly enlarged. The film on the tonsils was easily removeable without leaving a bleeding surface. These early clinical signs were on the whole against a diagnosis of diphtheria. Cultivations made from a swab showed the presence of cocci and a few wedge-shaped bacilli. On the 7th there was a more pronounced film, a second swab cultivation showing streptococci and other cocci. On the 9th there was definite false membrane of considerable extent and thickness. Large patches were visible on the left tonsil

and behind the posterior pillar of the right fauces. A piece of membrane stained and examined for bacteria showed the presence of streptococci and other bacteria. A swab cultivation after 24 hours' incubation showed the presence of spirilla, large fusiform bacilli, small faintly stained bacilli, a few tetracocci, and streptococci. The combined clinical and bacteriological evidence at this date appeared to indicate a case of Vincent's angina. In view, however, of the definite typical false membrane diphtheria antitoxin (2000 units) was administered. Pure izal and undiluted tincture of iodine B.P. were applied to the patches and a mixture of the perchlorides of iron and mercury was administered. On the 16th the following note was made: "Membranous formation still continues. The subjacent tissue, which at first was merely congested, has later become ulcerated and bleeding occurs on removal of the false membrane." A further swab cultivation showed numerous long streptococci but no diphtheria bacilli. From this date onward improvement gradually set in, the membranous formation (which was removed two or three times a day) becoming thinner, until finally it appeared to be nothing but the exudation from healing granulations.

Apart from the very definite false membrane of considerable extent the clinical signs were in my opinion against a diagnosis of diphtheria. This opinion was sustained by no fewer than five or six carefully made *negative* swab cultivations and by the clinical course of the case. The temperature did not at any time fall below normal. The case emphasises the importance of bacteriological confirmation of a provisional diagnosis of diphtheria, if such diagnosis is based on membranous formation alone. It further emphasises the importance of reserving an opinion until all the evidence available has been obtained. The reservation of diagnosis should, however, not interfere with the prompt administration of a small dose of diphtheria antitoxin, which should be administered without delay in every doubtful case without waiting for bacteriological evidence. It is unnecessary, I hope, to add that all necessary precautions were taken in the way of isolation and antiseptic applications throughout the case, for even if not a case of diphtheria such a throat is probably of an infective nature. Amongst precautionary measures for the prevention of spread in cases of infectious diseases, in addition to the efficient isolation of the patient I always advise the daily methodical use of an antiseptic gargle (preferably a solution of permanganate of potash) on the part of others living in the same house or who have otherwise been exposed to infection.

As to the etiology of the above case there was a history of dust having been blown into the mouth a day or two before onset. This dust probably carried in deleterious bacteria, such as streptococci, &c. The organisms cultivated from the false membrane were probably saprophytic bacteria which had found a suitable nidus for development in the false membrane. An important diagnostic point is the course of the temperature. In true diphtheria this soon becomes, and for a long time remains, subnormal. In the present case the temperature was never subnormal.

Southend-on-Sea.

FRACTURE OF THE EXTERNAL CONDYLE OF THE HUMERUS.

By W. E. HOME, M.D. EDIN.,
FLEET SURGEON, R.N.

FRACTURE of the external condyle of the humerus is so uncommon an accident that it may be well to put a case on record.

On July 28th a stoker on H.M.S. *Exmouth* caught his right elbow under the cross-head of a hydraulic engine. So violent was the blow that his arm bent the rim of a cast-brass lubricating cup. On examination he was found to have a lacerated wound on each side of the elbow. From the inner wound the finger passed through lacerated tissues down to the front of the humerus. Within the outer wound the muscles were slightly lacerated, the skin was partially separated even where not ruptured, and about an inch of the external condyle and supracondylar ridge was found lying free. No arteries bled. The loose piece of bone was fixed by a suture through its adherent soft parts. The wounds were drained and sutured (one deep silkworm-gut suture of relaxation, the others catgut continuous), and the elbow was put up in cotton wadding with elastic bandage over all. The drain was removed from the inner wound on the second and from the outer on the third day. The after-history was uneventful. The wound is now under cyanide gauze and collodion.

H.M.S. *Exmouth*.

Reviews and Notices of Books.

Traité d'Hygiène. Publié en fascicules sous la direction de M. BROUARDEL et M. MOSNY. *Hygiène Navale* Par les Drs. DUCHATEAU, JAN, et PLANTÉ. (*A Treatise on Hygiene*, published in parts under the direction of M. BROUARDEL and M. MOSNY.—Part 10, *Naval Hygiene*, by Dr. DUCHATEAU Dr. JAN, and Dr PLANTÉ.) One volume in octavo, 356 pages, with 36 illustrations in the text and three coloured plates. Paris: J. B Baillière and Son. Price 7 francs 50 centimes or in boards 9 francs.

IN this great work on hygiene the aim of the editors, the late Professor P. Brouardel and Dr. E. Mosny, is to formulate the contemporary hygienic knowledge of the world in as complete and perfect a manner as possible. It would be difficult to find two men better equipped for the task. Their names alone are an ample guarantee for the thoroughness of the work but they have, moreover, been successful in securing the collaboration of such well-known authorities as M. Chantemesse, M. Netter, M. Widal, M. Wurtz, M. Dupré, M. Thoinot, and M. Courtois-Suffit of the Faculty of Paris; M. Courmont and M. Lesieur of Lyons; M. Rouget and M. Dopter of Val-de Grâce; M. de Launay and M. Leclerc de Puligny, engineers; M. Ogier; M. Bonjean; M. L. Martin, chief medical officer of the Pasteur Institute; M. Calmette, director of the Pasteur Institute at Lille; and M. A. J. Martin, inspector of Parisian sanitation. It is proposed to complete the work in 20 parts, and so far five parts have been published dealing respectively with Atmosphere and Climate, Soil and Water, Individual Hygiene, Alimentary Hygiene, and Naval Hygiene. The last-named fascicule, as it is termed, which has just been submitted to us for review, stands tenth on the list and is divided into two sections. The authors of the first section, which treats of the navy and occupies about two-thirds of the volume, are Dr. Jan and Dr. Planté, both senior officers on the active list. For the second section, which occupies the remaining third and is devoted to the mercantile marine, Dr. A. Duchateau, who like his colleagues belongs to the navy, is responsible.

The French navy, in common with the other first-class navies of the world, has undergone such a complete transformation during the last few years, not only as regards ironclads and cruisers but also in connexion with the still progressive development of torpedo vessels and submarines, that the best attention has been devoted to attending to the sanitary details of the new constructions. No war vessel is now projected in which the requirements of hygiene can be said to be unduly disregarded. Of course, everything must yield to expediency. A war vessel is not a pleasure yacht; before everything it must be as good a fighting machine as possible; but in many ways that formerly were overlooked the health, and consequently the efficiency, of the fighters can now be safeguarded without interfering with power. From the point of view of the pure combatant hygiene should by no means be a negligible quantity. In the first subsection of their section Dr. Jan and Dr. Planté deal with war vessels; the internal arrangements of the several types, their habitableness, ventilation, warming, lighting, and water distribution. In the second subsection the mode of life of a modern sailor belonging to the navy is exhaustively reviewed as regards recruitment, duty, general and personal hygiene, and food. The third subsection treats of pathology and prophylaxis in peace time as well as

during war. In their fourth and last subsection the authors have to do with barracks and hospitals on land, together with the hygiene of arsenals and workshops. Under all these various headings we obtain instruction and information from men who write with full knowledge of their subject.

Dr. Duchateau commences his section with a disquisition on the rules and regulations affecting life and health which are common to all vessels engaged in commerce, including passenger traffic. Of late years something has been done to improve the hygienic condition of the mercantile marine, but many and grave defects still need remedying, especially in vessels of low tonnage which are destitute of medical supervision. The subject bristles with difficulties, chiefly on account of the opposition of small owners. On the great liners the needs of the crew are fairly well attended to, but in "tramps" the men are often treated like cattle. It is easy for a government to issue ordinances but their enforcement is not easy. Prejudice and routine together are too strong for the average legislator whose well-meant efforts consequently remain a dead letter. Dr. Duchateau affords complete details regarding the recruitment, composition, and strength of crews in French mercantile vessels, and discusses the employment of native assistance in Oriental waters. Then he turns to the hygiene of the different classes of vessel, including yachts, which are engaged in commerce, paying special attention to the fishing fleets which frequent the Northern seas. Chapters on ships and their cargoes and benevolent institutions follow, and the section concludes with an *exposé* of the diseases and accidents to which men who go down to the sea in ships and do business in great waters are peculiarly liable.

We are accustomed in England to receive our books with the pages cut ready for reading, but this praiseworthy concession has not as yet taken root in France. This is the only adverse criticism which we have to offer upon a thoroughly interesting and suggestive work.

Thought Transference. A Critical and Historical Review of the Evidence for Telepathy, with a Record of New Experiments, 1902-1903. By NORTHCOTE W. THOMAS, M.A. 1905. Pp. 214. Price 3*s.* 6*d.* net.

Crystal Gazing: Its History and Practice, with a Discussion of the Evidence for Telepathic Scrying. By NORTHCOTE W. THOMAS, M.A. With an introduction by ANDREW LANG, M.A., LL.D. 1905. London: Alexander Moring, the De la More Press. Pp. xlvii. + 162. Price 3*s.* 6*d.* net.

THE first of these two volumes is devoted to an examination of the evidence of thought transference. The author has examined the records of the Society for Psychical Research, together with other recorded examples, with a view to establishing the necessary criteria for belief in such a phenomenon. It is obvious that the difficulties to be encountered in any such investigation must be enormous, and that the details of any reputed success require the most rigorous analysis in order to eliminate all possible sources of fallacy. Mr. Thomas points out the importance of telepathy as a fundamental conception in regard to psychical research, defining it as an "influence of mind on mind exerted through other than the ordinary channels of the senses." He refers to the very numerous sources of error to which experiments in this direction are liable, among them being hyperæsthesia of the special senses, "subconscious interpretations of subconsciously perceived indications," where the subject and agent are within sight of one another, and "muscle reading," which entirely vitiates the validity of any experiment where contact is permitted. The importance of the subliminal consciousness in reference to telepathy is the subject of one chapter and the author states that "there is reason to suppose that the *primâ facie* telepathic impressions, the impressions communicated by other means than ordinary sensory methods, depend for their communication in some way on the subliminal consciousness." The reasons for this statement, however, are not given, indeed in the next sentence we are told that "how this happens we cannot, of course, say." This is the more to be regretted in that Mr. Thomas in one of his earlier strictures on incredulity specifically excepts the "sane scepticism which refuses to accept statements not backed up by sufficient evidence." The book contains a brief history of some of the experiments which have been made by various observers. The occurrence of telepathic hallucinations, telepathic hypnotism, and telepathic dreams is discussed and reputed examples are quoted. Then a record is given of some experiments conducted in 1902, mainly under the supervision of the author. In these experiments pictures, colours, diagrams, and numbers were suggested to, or given to, one party to the experiment called "the agent"; another called "the percipient," recorded the impressions received, the two being unable to communicate directly with one another as they were separated by a double screen. The supervisor of the experiment was so placed as to be able to watch both "agent" and "percipient." The net result of all the experiments is discussed, but the author leaves his readers to make up their own minds, merely hinting his own conviction that much more effort is needed before it can be maintained that telepathy is an established fact. Here Mr. Thomas is most temperate in his conclusions and in his recommendations, but at times he is intemperate in his criticism of those who are incredulous of the results of what is called psychical research, notably in his scorn of the psychologist and of the modern school of experimental psychologists who are endeavouring to apply mathematical and experimental methods to the elucidation of mental processes. We ourselves come under the lash of his satire for a criticism of certain recorded experiments.[1]

The other volume by the same author is devoted to a study of crystal gazing. It begins with an introduction by Mr. Andrew Lang, who affirms his belief in the capacity which some people are said to possess of observing people, places, or incidents, or "scrying" as it is called, in crystal globes, giving instances which have come under his own observation, where the element of possible fraud was reduced to a minimum. Mr. Thomas tells us that a crystal vision is simply a day-dream and that the faculty of "scrying" is closely allied to that of visualising. He gives an interesting history of crystal gazing and of the allied conditions of gazing at polished sufaces, or at water, at ink, or at the viscera of slain animals, as in the divinations of ancient times. We must confess that even after reading Mr. Thomas's book we do not regard crystal gazing as likely to be fruitful of much advance in useful knowledge. These two little volumes are obviously written with a view to provide some general information on the subjects dealt with so as to render "both scepticism and credulity less excusable"—as the author says in his preface. There can be no doubt that the deceptions and frauds of plausible rogues, to which workers in the field of psychical research are from the nature of things peculiarly liable, have done much to bring that form of investigation into disrepute, especially among the workers in physical and morphological subjects, where the conditions of experiment are more easily definable and where exact methods are more readily applicable. The author has endeavoured, and with no small measure of success, to indicate that there is a field for research and that very little has so far been accomplished. He is perhaps too severe on the incredulous

[1] THE LANCET, May 21st, 1904, p. 1431.

and the sceptical, and too prone to regard recrimination as argument, for he should remember that the onus of proof lies with those who affirm the existence of these phenomena, and with them likewise lies the refutation of adverse criticism, not in a spirit of irritation, but by actual demonstration of the errors of that criticism.

A System of Surgical Nursing, with an Appendix containing Useful Formulæ, Emergency Drill, &c. By A. N. McGREGOR, M.D. Glasg., F.F.P.S. Glasg., Assistant Surgeon to the Glasgow Royal Infirmary. Glasgow: David Bryce and Son. Pp. 554. Price 9*s.* net.

How much should a nurse be taught of general and special surgery? The answers of this question differ widely, if we may judge by the books provided for the teaching of surgery to nurses. The work before us is one of the best of its class, and its only real fault is that it supplies much more knowledge than the average nurse will ever absorb. There are in all 42 chapters without counting the appendix. The titles will sufficiently indicate their contents: General Principles of Surgical Treatment; Sepsis and Asepsis; Bacteria; Antiseptics; Wounds; Hæmorrhage; Treatment of Hæmorrhage; Repair of Wounds; and so on. Diseases are considered as they affect the various systems, the digestive, the nervous, and bones and joints. We have said above that we consider the book very good of its kind, though it may be a little over the head of many nurses. The teaching is good, and many useful hints are given on points which should be known to all fully trained nurses. There are no illustrations, not even in the chapter on bandaging, but we think that illustrations would have enhanced the value of the book in many of the chapters. We have little to say in criticism of individual statements. Saline solution is said to be of the strength of 0·6 per cent. It is generally recognised now that a somewhat higher percentage is preferable as more isotonic with the tissues. Saline solution, we are told, is only feebly bactericidal; we should be glad to have proof that it is bactericidal at all. The book is well printed on stout paper and it should prove very useful to any surgical nurse desirous of carrying out her duties intelligently and efficiently. We regret to see that the book is undated.

LIBRARY TABLE.

The Science of Common Life. By JOHN B. COPPOCK, B.Sc. Lond., F.I.C., F.C.S. With 76 illustrations. London: Swan Sonnenschein and Co., Limited. 1906. Pp. 273. Price 3*s.* 6*d.*—The science of common life cannot, of course, be summed up in a scheme of experimental chemistry and physics, which are after all the subject matter of this book. Nevertheless, the things of common daily contact are in the main evidences of chemical composition, activity, and affinity, and the presentation of these facts in scientific, yet withal intelligible, terms is the task which Mr. Coppock has undertaken, and, we may add, undertaken well. Primarily the book has been written to meet the requirements of the Board of Education's Syllabus on "The Science of Common Life," but we are glad to note that the author repudiates the common charge brought against cram-book writers, that their works are written strictly within the confines of a syllabus and therefore are opposed to true educational methods. He purposely omits, for example, to summarise the facts at the end of the chapter: "The student is asked to draw up his own summary after assimilation of the contents of a chapter. The summary provided by a master for a student without the student's previous assimilation of the material is not real knowledge but 'cram'—in short, not educational." We commend this opinion thoroughly. The chemistry and physics of common daily facts are set forth throughout the book in terms which should be intelligible even to the general reader, who may be undisturbed by thoughts of, or preparation for, an impending examination.

A Laboratory Manual of Physiological Chemistry. By ELBERT W. ROCKWOOD, M.D., Ph.D., Professor of Chemistry and Toxicology and head of the Department of Chemistry in the University of Iowa. Second edition. Revised and enlarged. Philadelphia: F. A. Davis Company. 1906. Pp. 229. Price $1.00 net.—This book provides an excellent laboratory course of physiological study and evident pains have been taken to bring the subject matter into accord with recent advance. We have followed the detailed directions given in the experimental portions of the book, and the conclusion is inevitable that the writer is perfectly familiar with those experimental details which are essential to success. There is, however, a tendency throughout the book to bring into prominence some experiments and to undervalue the importance of others, a course which suggests a routine for mere examinational purposes. The author, indeed, says that "for the purpose of making the course flexible the less important experiments or those which are not of general interest have been printed in smaller type." We cannot agree always that the matter in smaller type is of less importance; for example, the tests for albumin in urine and the fallacies of the tests for sugar in urine are of the first interest. By the way, is it not a little inconsistent to write "chlorin" and "iodin" while the French word "gramme" is retained in the unabbreviated form?

Looking Back.

FROM

THE LANCET, *SATURDAY*, Sept. 13th, 1828.

RUSSIAN ARMY AND NAVY MEDICAL SERVICE.

To the Editor of THE LANCET.

SIR,—Many English surgeons having proceeded to this place, in consequence of the official notification which has been addressed to foreign medical men, you will be doing a great piece of justice to the medical men in England, if you will have the goodness to communicate to them, through the medium of your valuable Publication, the contents of this letter, which may serve to give some idea of the treatment *they* will experience on coming to Russia. In the first instance, the notification states, they may either join the land or sea service. This is false; for on the application of *Englishmen* who have just arrived here, they have been told "the army is fully supplied;" and they may either embrace naval service, or return to whence they came. In the next instance, as regards the examination at the Academy, there are at present not less than thirty young men, principally Germans, with the exception of three Englishmen, who came to Petersburg with the idea of entering the service, according to the notification, who have been in attendance on the learned professor at the Academy for the space of *three months*, and with every probability of remaining three months longer. The conduct observed towards them has been highly infamous, and the state they are now in to my certain knowledge, is truly deplorable; in fact, nothing remains to be done but their immediate application to the different consuls or ambassadors, to be sent home as distressed subjects. Yesterday a body of them presented petitions to Dr. Cardanoff (the president of the Academy, in the absence of Sir James Wylee), for the return of their different certificates, preferring to get back as they can, to remaining in a country where they have been treated more like dogs than Christians. By making this publicly known, you will be doing much service to those gentlemen who have any idea of proceeding here.

I remain, Mr. Editor,
Your obedient Servant,

St. Petersburg, July 8, 1828. HENRY WILLIAMS, M.D.

THE BRITISH MEDICAL ASSOCIATION.

MEETING AT TORONTO.

(FROM OUR SPECIAL CORRESPONDENTS.)

THE Congress of the British Medical Association at Toronto closed on Friday afternoon, August 24th. The estimate of the numbers at the meeting already sent to you—viz., 2200—turned out to be practically correct, and it is generally considered that this constituted a very remarkable attendance.

The 13 sections were all located in the University and its constituent buildings and colleges, and were indicated by various sign-posts directing the way. The university park covers a considerable extent of ground, so that although all the sections were within its precincts they were not under one roof. A very useful addition to each section was a special room for the officers of the section. Most of the sections attracted considerable numbers to their meetings, and the discussions were of a high order of scientific and practical value, while the joint discussions held by various sections proved to be of great assistance and interest. The convenient manner in which the sections were housed, as well as the preliminary committee meetings held at the beginning of the week, much facilitated all the business of the sections.

The weather during the meeting has been extremely hot, and the great humidity of the atmosphere has made it uncomfortable for English visitors. But the two sharp thunderstorms which occurred during the week, associated with an almost tropical deluge of rain, had the effect of lowering the temperature, and apart from them the weather has been bright and clear. A topic of general discussion has been the general ignorance of the English people of the extent of Canada and of the nature of its climate. No little amusement has been caused by a report which is current that certain specimens sent to the exhibition were labeled, "Protect from frost."

The church service usually held at the commencement of the meeting was this year omitted, it will be perceived, but the proceedings of the inaugural ceremony were opened with prayer.

With regard to the social entertainments provided for the members, visitors, and ladies accompanying them, these have been unusually numerous and have been carried out with that open-handed generosity characteristic of the Canadians. Luncheon parties, garden parties, and evening receptions were given on each of the days of meeting. Among the parties, in addition to those already noticed, may be mentioned a luncheon for visiting ladies at the Lambton Golf Club on Wednesday, and garden parties given by Mr. and Mrs. Cox, and Mr. E. B. Osler, M.P., and Mrs. Osler. An evening reception was held on Wednesday by the Mayor and the City Council at the City Hall; on Thursday there was a reception in the Dean's garden at the University; and on Friday a very pleasant *réunion* was organised by the Royal Canadian Yacht Club at their club house on Toronto Island.

The excursions commenced on Saturday. The Entertainment Committee had arranged some attractive excursions, among them one to the Muskoka lakes and another to Niagara. The party for Niagara left Toronto at 9 A.M. and were taken to the Niagara Power Company works, now in course of construction, and afterwards entertained to luncheon at the Clifton Hotel by Sir Henry M. Pellatt. The enormous turbines now being installed and the long tunnel through which the water will be discharged afforded a most interesting and instructive sight. After luncheon the party made a tour of the Falls and of the Niagara River Gorge, *viâ* Queenston, Lewiston, and Niagara Falls, N.Y., returning to Toronto in the evening.

A considerable number of the British visitors left Toronto on Friday by the Canadian Pacific Railway to make the journey across the Rocky Mountains to the Pacific coast at Vancouver, which affords an excellent opportunity for observing the great resources and the wonderful scenery of the Dominion. Special facilities have been offered by the Canadian Pacific Railway Company to members attending the meeting, and many are availing themselves of the opportunity to remove some of that ignorance upon which Lieutenant-Governor Mortimer Clark expressed himself so strongly.

In preparing our reports of the proceedings at the general meetings and meetings of sections which follow we have received the most unvarying assistance from all the officials of the British Medical Association, and we wish to repeat our acknowledgments to them.

THE GENERAL MEETINGS.

TUESDAY, AUGUST 21ST.

THE first annual general meeting was held in the Convocation Hall on August 21st at 2 P.M. The Convocation Hall is a new building not yet entirely completed. It is of octagonal shape and is of classic design, its front elevation recalling that of the Pantheon at Rome. The chair was taken by the President, Mr. GEORGE COOPER FRANKLIN, of Leicester. In a brief speech Mr. Franklin said that it was his duty and privilege as *laudator temporis acti* to refer to the past year's work of the Association. He alluded to the time, work, and devotion given to it by gentlemen in busy practice who became members of council, representatives and members of committees. During the past year the rebuilding of the office at 429, Strand had been decided upon. He thought the Medico-Political and Ethical Committee deserved all the praise that could be bestowed on it. He wished to express his gratitude to the officials of the Association for their help during his year of office, mentioning especially Mr. Guy Elliston, Mr. Smith Whitaker, and Dr. Dawson Williams. He then introduced the new President, Dr. R. A. Reeve, dean of the University of Toronto, who took the chair and was presented with his badge of office by Dr. F. N. G. Starr, one of the local honorary secretaries. The delegates from British and colonial branches and the distinguished visitors were then presented to the new President. The former were numerous and came from nearly all the English, Scottish, and Irish universities and colleges and from many of the colonies, including all parts of Canada, Nova Scotia, India, Australia, New Zealand, and South Africa. Among the American delegates were Dr. W. J. Mayo (Rochester, New York), President of the American Medical Association, Dr. G. Ross (Richmond, Virginia), Dr. A. Macdonald (New York), and Dr. R. Woodward of the United States Department of Public Health and Marine Service. The foreign delegates included Professor Aschoff (Freiburg), Professor Delsaux (Brussels), Dr. Delezenne, Dr. L. Lapicque, Dr. Nicloux, and Dr. Nicolle of Paris, and Professor Gaule of Zürich. The MAYOR OF TORONTO then extended the welcome of the city and corporate council to Toronto, "the queen city of the west." They were delighted to welcome the Association and would do all in their power to render the visit a pleasant one. Professor IRVING H. CAMERON delivered a short address of welcome on behalf of the local reception committee, while Professor ALEXANDER MCPHEDRAN and Dr. G. A. BINGHAM delivered similar addresses on behalf of the Canadian Medical Association and of the Ontario Medical Association respectively. In accordance with the usual custom Mr. Franklin, the retiring President, and Sir Victor Horsley were elected Vice-Presidents of the Association for life. Dr. REEVE then delivered his presidential address, in

which he reviewed some of the chief advances made in medicine and its attendant sciences during the past decade.

The Presidential Address.

The PRESIDENT at the commencement of his inaugural address expressed his thanks for the position of honour in which he was placed and then made some reference to the success which had attended the meeting of the Association held at Montreal in 1897. He claimed that the credit for the auspicious conditions under which this second visit of the British Medical Association to Canada was made must rest largely upon those who had freely given most valuable help in various ways. It had been indeed a labour of love to bring the select and the elect of the profession from their posts of duty and busy round in the old homeland. He greeted them not only for their own sakes as men whose names were already household words or doubtless soon would be, but as worthy sons of worthy sires. For if Bacon, Shakespeare, Newton, Faraday, Kelvin, Clerk Maxwell, J. J. Thomson, and other lights of literature, science, and philosophy in the British firmament, were blotted out there would only be a partial eclipse, for would not Hunter, Harvey, Sydenham, Jenner, Simpson, and Lister present a resplendent galaxy? He pointed out that the present gathering was almost a cosmopolitan one. International comity had always prevailed in the medical profession, for disease knew no distinction of country or race and was the common lot of humanity. In the face of a ubiquitous foe it was natural that the confraternity of the healing art should be undivided. The recognition of English talent and experience on the part of the late Emperor of Germany, the consideration shown by the British sovereign to the eminent bacteriologist Professor Robert Koch, and the action of the United States in calling to its counsels British experts in tropical medicine upon the threatened invasion of yellow fever, were convincing proofs of the international harmony which existed with regard to the prevention of disease. The Canadians, for their part, were glad in obedience to the unwritten code and by means of this gathering to aid in cementing the tie that already bound the great Anglo-Saxon people to those of the lands of professional culture and erudition—France and Germany.

The President then briefly sketched the early history and subsequent development of the British Medical Association. In the next place he reviewed the progress made in medicine during the last decade. Many years, he said, must be regarded as compressed into the decennium in which Lister and Pasteur, Koch, Metchnikoff and Behring, with genius and untiring energy in quest of truth, solved their mighty problems and gave the world such talismanic words as antisepsis, asepsis, immunity, and serum-therapy. The work of these men proved not only a vast boon to sufferers from accidents and disease but a grand object-lesson to mankind in general and recent years had seen the result in princely gifts bestowed in the interests of science and humanity. An immense amount, however, still remained to be done. It was true that nursing had become a fine art, diphtheria had been largely robbed of its terrors, and, though rampant, was curable, and the mortality of typhoid fever had been reduced one-half. On the other hand, however, the fatality of cancer had steadily increased; tuberculosis, which had been called the white plague, stalked through the land, and the death-rate of infants, owing mostly to intestinal troubles, although not on the increase, was still very high. One almost felt as if the hands of the clock had gone back on the dial of the world's progress when one recalled that at Jenner's centenary the city where his method of vaccination had come into vogue was in the throes of an epidemic of small-pox due to the ignoring of his great discovery. There was yet ample scope for State medicine to ply its persuasive powers until men thought aright about matters which affected the well-being of the community, and the presumed welfare of the individual was not allowed to stand against the weal of the masses. In the matter of compulsory vaccination a true paternalism of the State with the active support of the medical profession should override so-called conscientious scruples. When vaccination was performed under the rules of asepsis, as it always ought to be, and with the use of pure lymph now always to be had, the risk was practically nil. The work of the decade had given the profession itself some new ideas in regard to the mechanical and chemical processes of digestion. It had been shown that the first part of the stomach was a mere receptacle and that the second part was a kind of mill which was perforce the more common seat of mischief requiring surgical treatment. The value of thorough mastication and the necessity of the avoidance of mental states which would divert nervous energy and thereby interfere with the digestion had been shown by Pawlow's studies. A notable work on "Physiological Economy in Nutrition" by Professor Chittenden of Yale University embodied the basis of a change of faith and a new practice. Professor Chittenden had proved incontestably that too much food not only meant loss of vitality in the disposal of it but entailed a positive risk from the resulting toxins ere these products of metabolism were finally got rid of. He had also shown that one-half or one-third of the nitrogenous (protein) food ordinarily taken was sufficient for maintaining the bodily energies, and that this reduced dietary entailed a minimal tax upon the liver, the kidneys, and the digestive tract. A supply of clean pure milk to communities was declared to be one of the greatest boons to humanity and good service in keeping this question before the public had been done by the pædiatric societies in the United States. The warning of Sir Thomas Barlow in 1894 was quoted to the effect that condensed milk, and even sterilised milk, were not efficient substitutes for the natural food of the infant and that infantile scurvy might be caused by their sole use. The marked increase in the debt which medicine owed to physiology and physiological chemistry was acknowledged and a grateful tribute was paid to Sir Victor Horsley for his researches in physiology. With the growth of more exact knowledge of the causes and nature of disease there had come more faith in the natural powers of the human body and in the value of the aid which could be given by nursing, dieting, &c. The discovery that pneumonia was always a septicæmic disease and that its specific microbe was present in the blood gave the clue to its prevalence and high mortality—greater indeed, than of yore, doubtless owing to the large and increasing percentage of dwellers in cities and towns. A protective and curative serum or "vaccine," as in the case of diphtheria or typhoid fever, was the hoped-for remedy. The discovery of a specific microbe in cerebro-spinal meningitis, the recognition of its mode of entrance into the system through the mucous membrane of the nose and throat, and the trial of repeated lumbar punctures and injections of diphtheria antitoxin with uncertain results, were features of interest in this serious malady which, by the way, was not so fatal as some supposed. The discoveries that the infections of yellow fever and malaria were carried by flies were reviewed and tributes were paid to Lazear of the American commission and Myers of Liverpool, who fell victims to the deadly diseases which they were investigating and might well be said to have given their lives for the good of others. That their labours had not been in vain was shown by the success with which the recent plague was stamped out and Havana and other pest centres had secured exemption. In conclusion, the President said that preventive medicine as a result of the decade's work alone gave sure promise of saving more lives and sparing more misery than could be accomplished by a treaty of universal peace.

A vote of thanks to Dr. Reeve was proposed by Dr. H. BARNES (Carlisle) and seconded by Dr. T. G. RODDICK (Montreal), while Mr. FRANKLIN and Sir JAMES BARR proposed a vote of thanks to the Mayor for the civic reception. The meeting was then adjourned till 8.30 P.M. At the adjourned meeting, which was held in the Convocation Hall, the Address in Obstetrics was delivered by Dr. W. S. A. GRIFFITH on the Teaching of Obstetrics.[1]

WEDNESDAY, AUGUST 22ND.

The second general meeting was held to-day at 2.30 P.M., when the Address in Medicine[2] was delivered by Sir JAMES BARR on the Circulation viewed from a Peripheral Standpoint. The meeting was adjourned until 8.30 P.M., when Sir VICTOR HORSLEY delivered the Address in Surgery[3] on the Technique of Operations on the Central Nervous System.

FRIDAY, AUGUST 24TH.

The final general meeting was held this afternoon at 2.30 P.M., and was fairly well attended, though members of the Congress had already begun to melt away.

[1] THE LANCET, August 25th, p. 490.
[2] THE LANCET, August 25th, p. 479.
[3] THE LANCET, August 25th, p. 484.

THE SECTIONS.

MEDICINE.

TUESDAY, AUGUST 21ST.

The Section, which was very largely attended, met under the presidency of Sir THOMAS BARLOW (London), who in his introductory remarks referred to the honour of the position of president and to the generosity of the Canadian members of the section in the large share of the time at their disposal which they had allotted to the visiting members.

A discussion was then opened by Dr. PERCY M. DAWSON (Baltimore) on

Blood Pressure in Relation to Disease.

He dealt with certain physiological considerations in regard to blood pressure, emphasising some points which are often overlooked and bringing forward new work. The physiological problems involved in blood pressure offered a wide field for discussion; it was necessary therefore to limit his observations to certain selected topics. At the outset he proposed to define certain terms in order to avoid the confusion resulting from the use of the term "blood pressure" without a qualifying adjective. Careful definitions, illustrated by diagrams, were given of systolic blood pressure, of diastolic blood pressure, and of the pulse pressure, the last being the difference between the other two. It was further stated that applying the results obtained in artificial schemata of the circulation the change in pressure in the aorta during a cardiac cycle was proportional to the change of velocity in the vessel during that time, and Dr. Dawson concluded from his experiments that the pulse pressure might be taken as an index of the systolic output of the heart. Considering the work of the heart, this could be represented by the formula $W = MgH$, where W = the work, M represents the output of the heart, g the force of gravitation, and H the mean pressure in the aorta. The mean pressure in the aorta could be estimated by taking the sum of the diastolic pressure in the brachial artery and one-third of the pulse pressure in that vessel; therefore in this determination the only technical proceeding involved was the estimation of the pressures in the brachial artery. Dr. Dawson indicated the essential requirements of a good instrument for this purpose and emphasised the necessity of determining both the systolic and diastolic blood pressures and of their relation to one another, the difference between them affording the measure of the pulse pressure.

Dr. G. A. GIBSON (Edinburgh) contributed to the discussion a paper on

Clinical Methods of Investigating the Blood Pressure.

He first outlined the various factors in keeping up the blood pressure which should be kept in mind—viz., the initial pressure or energy of the heart, the peripheral resistance (especially that of the splanchnic area), the elasticity of the vessels, the amount of blood in circulation, and the viscosity of the blood. He regarded the so-called *tactus eruditus* as antediluvian and antiquated, and no more to be relied on than the sensations obtained by the hand laid upon a patient's skin would be taken as a gauge of the temperature of the body in pyrexia. He stated as his conviction after 30 years' clinical experience that mere estimation of blood pressure by means of the fingers goes for but little, and that the observation of alterations in blood pressure could only be made by modern instruments. He pointed out that the first observations were made by Vierordt by means of a sphygmograph 51 years ago but that the first noteworthy work on the subject was that of von Basch 25 years ago. He went on to describe the various forms of sphygmomanometer and to classify them according to the manner in which they acted or in which they were applied. The various forms were then criticised and in the case of those encircling the arm the importance of the use of a broad band was insisted on. The instruments of Riva-Rocci and of Janeway gave both systolic and diastolic pressures but Dr. Gibson had found that the only instrument which could be relied upon to give both these values accurately and graphically was the sphygmomanometer of Erlangen, of which he spoke in most enthusiastic terms. The normal limits of these values were in normal persons: for systolic pressures, 90–140 millimetres of mercury; for diastolic pressures, 60–110 millimetres. The influence of various conditions upon these values was described. The effect of posture was so marked that observations should always be made with the patient in the horizontal position; moreover, the time at which the observations were made should be recorded, since the pressures were highest in the morning, although an afternoon rise occurred as well. The influence of food and of occupation had also to be taken into consideration. The observations ought in all cases to be recorded on blood pressure charts.

Sir WILLIAM H. BROADBENT (London) dealt with

The Clinical and Therapeutical Indications of Morbid Blood Pressure.

He differed from Dr. Gibson in regard to the investigation of the pulse by the finger, maintaining that ultimately they would have to rely on the *tactus eruditus*, and further that the real place of the instrumental investigation was in the education of the finger. He referred to the importance of the study of the conditions in the capillaries in regard to questions of blood pressure—notably the intracapillary pressure, the viscosity of the blood, the cohesion between the blood and the capillary walls, and the permeability of the capillary walls. The blood-vessels and their nerves were the servants of the tissues and the variations in pressure and in calibre were due to the requirements of the tissues. The chemical variations in the blood in the capillaries were also of importance in regard to capillary transudation. It was necessary to consider blood pressure from two aspects—first, as it exists in the capillaries, and secondly, in the arterial circulation. It was by the radial pulse that they could estimate clinically the blood pressure on the arterial side of the circulation. Sir William Broadbent then gave an account of the characters of the pulse and the blood pressure as estimated by the finger in various conditions, and pointed out the importance of determining whether the heart or the peripheral resistance was concerned in producing a given rise or fall in the blood pressure; he thought that instrumental indications must always be confirmed and extended by examination of the heart. Various illustrations were then given, among them the lowered blood pressure of pyrexia, in which, in spite of the increased frequency of the heart's action, blood pressure fell because of the diminished resistance at the periphery. The therapeutic indications consisted in the application of the principles enumerated—viz., in the determination of the part played by the heart and the peripheral resistance respectively, and the administration of appropriate measures, such as cardiac tonics in the former case or of nitrites or calcium salts in the latter. The influence of diet, of water drinking, and of mercurials was also considered.

Professor T. CLIFFORD ALLBUTT (Cambridge) then contributed to the discussion a paper on

The Relation of Blood Pressure to Arterial Sclerosis.

He first wished to indicate three points of importance in regard to his own work—viz., that his observations of blood pressure were nearly all made from 10 to 12.30 in the morning, that they were made in his private practice, and that they were invariably made after the ordinary examination of the patient was completed and the circulation therefore more quiet. Arterial sclerosis was not the name of a clinical condition but was rather a term pertaining to morbid histology. Arterial sclerosis was found in a variety of conditions and he recognised three classes or groups—viz.: Class 1. The toxic cases—chiefly in certain infections. The blood pressure varied in this group; in some, as in those cases due to syphilis, it was not raised, while in others, as in lead poisoning, it was increased. Class 2. The hyperpietic group; in these cases there was considerable arterial stress and a large proportion of the cases were the subjects of granular disease of the kidney. Class 3. The involutionary group; chiefly due to senile degradation and associated with trophic or mechanical causes. The blood pressure in these cases only rises to the quasi-normal standard of the age of the individual. These various groups of causes might be combined. Professor Allbutt, having referred to the important work of Traube, von Basch, and Potain in building up our clinical knowledge of arterial sclerosis, outlined his own observations which had led him to the conclusion that high pressure and arterial sclerosis were not a measure of one another, and that arterial sclerosis had little effect in raising blood pressure. He had employed the term "hyperpiesis" to indicate prolonged high pressure, while the hypertrophy of the muscular coat which occurs had been called hypermyotrophy, this latter being a readjustment to counteract the tendency to dilatation of the vessel. Hyperpiesis itself was not a disease but a mechanical adjustment to a diseased

condition. In hyperpiesis two different states of the radial artery were found; one in which there was a small straight vessel, and the other with a laxer, more tortuous "leathery" artery. In regard to prognosis in the involutionary cases it was good in regard to length of life, whatever in the course of time might be that diminution of vivacity and adventure which elderly men were pleased to interpret as mellow conservatism, and the tolerant sagacity of experience. The prognosis in the hyperpietic cases was most perilous. Professor Allbutt strongly emphasised the importance of the instrumental investigation of the pulse.

Dr. J. MACKENZIE (Burnley) contributed some remarks illustrated by pulse tracings on some forms of heart failure consequent upon long-continued high arterial blood pressure. He referred to the five properties of heart muscle described by Gaskell—viz., tonicity, excitability, rhythmicity, contractibility, and conductivity—and illustrated his contentions by reference to a series of cases of arhythmia. He forcibly pointed out the value of the pulse indications in respect of treatment.

Dr. J. LINDSAY STEVEN (Glasgow) supported Sir William Broadbent in his contention that the trained finger was the ultimate appeal in clinical work. He recognised two chief varieties of increased blood pressure, (1) temporary and recurrent, due to errors in diet, mental excitement, constipation, and effort; and (2) a continuous or persistent form associated with chronic Bright's disease, especially the small red kidney. Dr. Steven differentiated between atheroma, which was a focal disease of the aorta and the arteries of the brain, and arterio-sclerosis, which was a generalised affection, especially of the medium-sized vessels. In his opinion high arterial tension might be the result of arterio-sclerosis, but was never the cause of it.

Professor ALEXANDER MCPHEDRAN (Toronto) referred chiefly to clinical methods. He supported Dr. Gibson in his contention that the *tactus eruditus* was not trustworthy. He recommended that the instrumental determination of blood pressure should be made after quiescence of the patient and at the end of the interview. He had observed a case in which a man was waterlogged to the waist in whom the pulse did not seem to the finger very high, but when measured by a sphygmomanometer it proved to be 280 millimetres of mercury, and it was only little reduced by nitrites. On the other hand nitrites yielded favourable results in cases due to arterial spasm.

Dr. G. W. MCCASKEY emphasised the importance of the factor of peripheral resistance, and the effect of the nitrites in relieving increased pressure due to spasm and of their value in diagnosis.

Dr. ALFRED STENGEL (Philadelphia) read a paper on

Some Clinical Manifestations, Visceral and General, of Arterio-sclerosis,

which was taken as part of the general discussion. He had found continuous fever, lasting over considerable periods of time, in arterio-sclerosis without any local lesion to account for it, such as pyelitis or other infection. He regarded the fever as possibly due to the active disorganisation of the tissues of the vessel wall, on the analogy of ferment fever. He referred to the occurrence of fever in aneurysm and in cases of acute aortitis. He had also observed suggestive symptoms in abdominal arterio-sclerosis. The patients suffered from repeated attacks of cramp-like pain, with marked intestinal distension and constipation, the attacks sometimes proving fatal, when atheroma and even thrombosis of the mesenteric vessels were found at the necropsy. Max Buch of Vienna had recently described 25 cases of this kind and regarded some of them as due to arterio-sclerosis of the abdominal vessels, others as an abdominal manifestation of angina pectoris. The ulceration of the intestine not infrequently seen in chronic nephritis Dr. Stengel was of opinion is associated with the arterial disease existing in that condition.

Dr. WILLIAM EWART (London) spoke on the relation of chronic disease of the arterial wall to the pathological and physiological factors of increased arterial tension—notably of the intermittent factor of muscular work and of the fatigue toxins associated with it and of the continuous factor of the toxins of disease or of disturbed metabolism. He referred to the importance of adequate sleep in regard to arterial spasm and strain, allowing the vessels to relax and lessening the work to be done.

WEDNESDAY, AUGUST 22ND.

A joint discussion was held with the Section of Physiology on

Over-nutrition and Under-nutrition, with Special Reference to Proteid Metabolism.

The discussion was opened by Professor RUSSELL H. CHITTENDEN (Yale) who pointed out that at the outset they were confronted with the inquiry as to what were the normal requirements of the body for food. In a general way it might be said that a man required enough food to establish physiological and nitrogenous equilibrium and sufficient to maintain that strength of body and mind which was essential to good health, and to afford the highest degree of physical and mental activity with the smallest expenditure of energy, and at the same time to preserve and heighten if possible the ordinary resistance of the body to disease-producing organisms. The smallest amount of food which would secure these ends would be, in his opinion, the ideal diet. Certain dietary standards had been generally accepted throughout the civilised world based largely upon the general experience of mankind, and the experiments of Voit and his pupils had apparently lent scientific authority to these. In the present discussion it would be profitable to consider whether the ordinary dietary standard conformed to the conception of the amount of food necessary to effect the ideal conditions just described, confining attention to the proteid or nitrogen requirements and considering the Voit standard of 118 grammes of proteid daily for the ordinary man of 70 kilogrammes weight. This amount was practically 105 grammes of absorbable proteid or 16 grammes of nitrogen, which was equivalent to 1·5 grammes of proteid per kilogramme of body weight. Physiologists usually considered that when an organism was in a state of nitrogenous equilibrium the body as a whole and its separate organs were being duly nourished as regards nitrogen. The maintenance of a nitrogenous equilibrium at a low level of intake of nitrogen might be of interest as affording a clue to the minimum quantity of proteid food necessary to repair the nitrogenous waste. It must be admitted as possible that some excess of proteid food over and above the smallest amount necessary to establish nitrogenous equilibrium might be desirable for the maintenance of good health, although there was no conclusive evidence of this. Many experimenters, among them Hirschfeld, Kumagawa, and Breisacher, had studied the effect of lowered nitrogenous intake for brief periods of time, and had demonstrated that it was quite possible to maintain a nitrogenous equilibrium on a diet containing only one-half the amount of proteid food in the Voit scale. Professor Chittenden had carried out experiments over extended periods of time in order to meet the criticism that the time was too short to admit of accurate conclusions being drawn. In his own work five professional men were fed for periods of from six to nine months on an average daily metabolism of from 5·4 to 8·99 grammes of nitrogen—i.e., 34 to 56 grammes of proteid per day. In three of the cases, individuals of different body weight, there was a close agreement in the amount of nitrogen required, which was 0·1 gramme, 0·093 gramme, and 0·102 gramme respectively per kilogramme of body weight, the other two cases requiring somewhat more—viz., 0·14 and 0·139 gramme of nitrogen per kilogramme of body weight, which was not more than half of the Voit standard. Moreover, in these experiments the non-nitrogenous food was not increased in quantity. Further, to meet the criticism that such diets could not be borne indefinitely one of the subjects had lived at that level for four and a half years, and, as he believes, with great gain to himself. Similar results had been obtained in 11 soldiers from the hospital corps of the United States army, also with a third group of men, eight in number, mostly athletes, in whom the nitrogenous intake was reduced to from 0·108 to 0·134 gramme per kilogramme of body weight per day. Professor Chittenden was of opinion that 0·1 gramme of proteid capable of metabolism per kilogramme represented the minimum proteid requirement, but it would probably be advisable to adopt a standard somewhat above this figure and to give from 50 to 60 grammes of absorbable proteid to a man of from 60 to 70 kilogrammes weight—i.e., a reduction of about 50 per cent.

Professor W. D. HALLIBURTON (London) said that the large attendance at the discussion was the best evidence of the importance of the subject. In general he was in agreement with most of Professor Chittenden's conclusions, and there could not be any doubt that among meat-eating nations many

people eat too much and harmfully in excess. He pointed out that observations on animals in this regard though suggestive were not conclusive—e.g., the dog, an animal with high proteid intake, and the ox, an animal with a low one, were both strong animals. The special feature of Professor Chittenden's observations was the fact that they were made on the human subject and over prolonged periods of time. He instanced the dietary of the poor in large cities and the low nitrogenous intake in vegetarian nations, and stated that it was maintained that such people showed less resistance to privation and to bacterial invasions than meat-eating people. He had been interested to read that Lafcadio Hearn, in writing of the Japanese, attributed their recent vigour and success to their tendency to give up vegetarianism and take larger quantities of animal food. Professor Halliburton further instanced the effect of overfeeding in the open-air treatment of pulmonary disease and in the rest cure for neurasthenia. Proteid in the body served two chief purposes, first, to repair waste of the tissues, and secondly, to act as a source of energy just as fats and carbohydrates do. He was of opinion that if we reduced the amount of proteid to that minimum necessary to subserve the first of these functions we should be dangerously near the margin. He quoted some views of Dr. Leathes who had pointed out that in infants ten times the minimum quantity of nitrogen necessary to repair waste was taken in the diet, even allowing for growth, and therefore asked if it would be physiological for the adult to live too near the minimum.

Dr. OTTO FOLIN (Waverley, Mass.) considered that the important question was to consider the validity of the standards of diet which had prevailed for the past two generations based on the work of Voit and his pupils. Their conclusions had been repeatedly disposed of and yet the Voit standard had remained, the reason being that there was a conviction that the more effective portions of mankind indulged in a diet of this kind, and thus Voit's experiments lent scientific dignity to a popular belief. Statistics were often invoked in support of the contention that the majority of people adopted a diet conforming to the Voit standard, and that greater consumption of food was associated with greater productive capacity. Such statistics required scientific examination since they proved too much. Nothing would be more conducive to advance in this field of work than a frank acknowledgment of our uncertainty and ignorance in regard to the problems of nutrition, while to bring forward the general experience of mankind, a special case of the survival of the fittest, as an argument in favour of a high nitrogenous intake was as rational as to invoke the same argument in support of the use of alcohol, tobacco, tea, and coffee. The optimum proteid diet would probably be between the two extremes, but at present there were no data to enable them to determine this amount, and it would be wise to recognise this.

Dr. ROBERT HUTCHISON (London) contended that the problems of nutrition could not be solved by either the physiologists or the physicians alone, but that it required the coöperation of scientific and clinical workers. The physician and the physiologist approached the matter from entirely different points of view: the physiologist dealt with the normal, ideal or average, whereas the physician with the abnormal, with idiosyncrasies, and with the diseased organism. The physiologist asked what was the proteid minimum, the physician required to know what was the proteid optimum, and these were not necessarily the same. He fully accepted Professor Chittenden's results as regards the minimum and paid a tribute to the American workers in the investigation of nutrition, but he would not accept any suggestion that the optimum and the minimum were the same. It was of interest to notice that in the body there was a tendency towards a reserve, and he would quote the French proverb, "*Pour avoir assez il faut avoir trop.*" It would be of interest in the future to ascertain in persons taking a lessened nitrogenous diet the opsonic index in regard to various disease-producing organisms and the way in which such individuals passed through an acute illness. At present the physician was perplexed by the various statements made in regard to the relation of various diets to disease. In regard to the low nitrogen diet it was stated that gout and rheumatism were relieved by it, while others maintained that a vegetable diet would effect the same end, while recently another school had maintained that one of the main faults in our diet was an excess of fat and carbohydrate rather than of proteids. He further discussed the question of over-nutrition in regard to the fats and pointed out that under the conditions of civilised life there was less use for fat than in the savage state of man. Another point which physiologists were liable to overlook was that of the individual peculiarities or idiosyncrasies. It was important for us to know whether the fact that some persons remained thin on large diets while others could not reduce their fat in spite of very small ingestion of food might not be due to some individuals being more economical machines than others.

Professor L. LAPICQUE (Paris) referred to the effect of climate on diet.

Dr. C. B. RAMARAO (Madras) gave his own personal experience. As a Brahman and a member of a community prohibited from partaking of animal food, he lived on an entirely vegetarian diet and was of opinion that vegetable proteids could be as effectively digested and assimilated as those of animal origin. He instanced the fact that thousands of his countrymen lived in perfect health, carrying out good mental and physical work in their own spheres, who had never touched animal food.

Sir JAMES GRANT (Ottawa) maintained that more people died from excess of food than from excess of alcohol, but stated that in the cold climate of Canada more food material was required than in the Tropics.

Sir THOMAS BARLOW congratulated Professor Chittenden and expressed the gratitude of physicians to him for his elaborate and exhaustive researches. The results obtained demanded a reconsideration of the whole subject and would doubtless eventually modify the customs of the profession and the laity. There were two or three points which would occur to practising physicians as requiring solution. One was the reason of the marked improvement resulting in the condition of a child fed on cereals and milk for two years when meat was added to the dietary. Another was the rapid improvement in the process of convalescence from many diseases when meat was given to the patient, and a third was the beneficial effect of overfeeding in pulmonary tuberculosis and neurasthenia. Professor Chittenden recommended a diet which was above the minimum and he (Sir Thomas Barlow) would ask whether there were not a place in the economy for an excess of proteid above the minimum requirements.

Professor CHITTENDEN, in reply, thought that one of the objects achieved by the discussion was that a clear appreciation had been obtained of our lack of knowledge regarding the fundamental problems of nutrition. One of the aims of his work had been to discover whether data based upon the general experience of mankind were in absolute harmony with the physiological requirements of the body. It was also possible that some of the ills of mankind might be ameliorated by living nearer to the low level of proteid metabolism. In regard to the improvement brought about by meat added to the diet of children and convalescents, he suggested that the extractives of meat might play a part in this. In referring to the difference between animal and vegetable proteids in diet it must be confessed that they knew little. That there was a great difference in their constitution was certain, since a vegetable proteid would yield as much as 37 per cent. of glutaminic acid on decomposition, whereas meat proteids yielded only 11 per cent.

Dr. L. F. BARKER (Baltimore) read a paper on

Amino-acids and Metabolism.

He pointed out that the application of chemical study to the problems of biology had yielded great results and especially of late in regard to the structure of proteids. All consisted of long chains of relatively simple bodies called amino-acids into which they could be split. More than a dozen of such bodies had been obtained from egg albumin. The amino-acids could, moreover, be artificially chained together and bodies were obtained with characters closely approaching those of proteids—especially the peptones. There were both mono- and di-amino-acids and some 20 of these bodies were now known in the laboratory, among them glycocoll, leucin, tyrosin, lysin, and arginin. A study of the amino-acids present in various forms of proteid food revealed the interesting fact that a human being took about the same quantity of these bodies, whether fish, white meat, or the ordinary meats be taken. The chemist by synthesis was now preparing from these a series of substances called peptides—viz., dipeptides, tripeptides, and polypeptides. It was now recognised that the effect of ferment was to break proteids down into simpler and simpler bodies, the reason being that every animal

possessed its own specific proteids and used other proteids in order to build up its own waste; therefore, these proteids were broken down into these amino-acids and then re-united to form the specific proteids of the animal's body. There was now evidence that each cell of the body had to take the serum proteids and break them down again in order to build up its own specific proteids. The question arose as to the fate of superfluous amino-acids. They were oxidised and got rid of as urea. The study of these problems was likely to throw considerable light upon some forms of disordered nutrition, such as cystinuria and alkaptonuria.

Dr. W. B. THISTLE (Toronto) read a paper on

The Treatment of Typhoid Fever.

He discussed the possibility of limiting or preventing the intestinal lesions of the disease and detailed his own practice of giving purgatives and antiseptics throughout the course of the disease. The suggestion made was that purgatives insured increased elimination of the typhoid organisms and their toxins and that therefore they were likely to be of use as in uræmia and lead poisoning. He gave a few grains of calomel and some salol. In his opinion purgation, especially early in the course of the disease, was of great importance.

Dr. W. CALWELL (Belfast) avoided giving purgatives to typhoid fever patients in any form. He quoted some statistics of 150 consecutive cases, showing that the mortality in cases with constipation was very slight, whereas in cases with diarrhœa it was much greater.

Dr. T. M'CRAE (Baltimore) pointed out that the view that typhoid fever was to be regarded as a blood or general infection was gaining ground and that the intestinal lesions were on this supposition to be looked upon as secondary, and as a consequence purgatives were hardly likely to be of value in diminishing the intestinal ulceration. As regards the use of antiseptics he was of opinion that they were of no value because it was impossible to give sufficient quantities to exert any beneficial action. In his experience the elimination of organisms and toxins took place much more through the kidneys than by the bowel, and the good effects of bath treatment were probably due in no small degree to the increased elimination induced by it through the kidneys.

Dr. W. H. NEILSON (Milwaukee, Wisconsin) referred to a case of typhoid fever treated by himself in which severe intestinal hæmorrhage occurred. He induced constipation over a period of nine days and yet obtained no evidence of intoxication from intestinal absorption. The patient recovered.

Professor MCPHEDRAN opposed the use of purgatives, insisting that typhoid fever was a general disease.

Dr. BARKER pointed out that after recovery from typhoid fever large numbers of bacilli might remain in the body and that therefore the mere number of organisms present in the intestine could not be regarded as of great importance in regard to the disease.

Dr. J. H. HAMILTON (Erin, Ontario) was of opinion that purgatives were of value but that they should only be given early in the disease. He also believed in the use of intestinal antiseptics.

SURGERY.

WEDNESDAY, AUGUST 22ND.

The special discussion on

The Surgical Treatment of Ascites Secondary to Vascular Cirrhosis of the Liver

was opened by Mr. SINCLAIR WHITE (Sheffield). He said: Surgical intervention for the relief of cirrhotic ascites is based on well-known anatomical and pathological data. Normally there are four sets of anastomotic vessels uniting the systemic and portal venous systems. These comprise: 1. Veins running in the falciform and round ligaments of the liver—the so-called accessory portal system of Sappey—which connect the portal vein with the epigastric, the internal mammary, and the diaphragmatic veins. 2. The anastomoses between the gastric and œsophageal veins. 3. Veins between the superior and middle and inferior hæmorrhoidal veins. 4. Retzius system of veins situated in the retro-peritoneal tissue, and especially well developed behind the pancreas, the transverse portion of the duodenum, and the vertical portions of the colon. The enlargement of the normal anastomotic veins occurs with great constancy in cirrhosis of the liver and is occasionally associated with newly formed veins running in adhesions between the viscera drained by the portal vein and the abdominal walls. Pathologists have long been familiar with the fact that typical cases of cirrhosis of the liver may run their course to a fatal issue without the advent of ascites provided the collateral circulation is well developed. Drummond and Talma, impressed by the part played by the veins of new formation in warding off ascites, conceived, independently of each other, the idea of creating adhesions between the abdominal viscera and the parietes. Of these the great omentum, both by reason of its vascularity and flexibility as well as by nature's example, appeared to be specially adapted for the purpose and operative procedures for the relief of ascites, however they may differ in detail, always include fixation of the omentum to the abdominal wall. The operation was first performed, at Talma's suggestion, by Van der Meulen in 1889, but with a fatal result. The first successful case was operated on by Rutherford Morison in 1895. This patient lived for two years without recurrence of the ascites. Death followed 48 hours after a trivial operation for ventral hernia and a post-mortem examination revealed the existence of numerous new veins running between the liver, the spleen, the omentum, and the abdominal walls.

In regard to *pathology*, the chronic inflammatory changes induced by the poison, whether it be alcohol or some other agent, lead to degeneration of the hepatic cells and proliferation, with subsequent contraction of the connective-tissue framework of the liver. The latter in turn interferes with the circulation of the blood through the hepatic terminals of the portal vein. Side by side with these pathological changes in the liver there may be developed a more or less extensive chronic peritonitis, and when the incidence of the poison is specially marked on the peritoneal covering of the liver we get perihepatitis. So far there is general agreement among pathologists, but as to the immediate cause of ascites in cirrhosis of the liver two widely divergent opinions prevail. The commonly accepted view is that it is largely a passive effusion of blood serum; that it appears in cirrhotic cases when the enlargement of the collateral circulation fails to keep pace with the ever-increasing portal constriction; that while contraction of Glisson's capsule is the principal cause of obstruction it may be supplemented by partial or complete thrombosis of the portal vein; and that systematic circulatory defects, such as valvular lesions of the heart, may aid the local causes of blood stasis. On the other hand, Hale White, Rolleston, and others reject the doctrine of passive effusion, giving as their most important reason for so doing the negative results obtained in experimental ligation of the portal vein in animals. They allege that the peritoneal dropsy of uncomplicated cirrhosis of the liver is due to the presence of toxic substances in the blood; that these bodies possess lymphagogue properties and are the outcome of defective metabolism on the part of the liver, whose damaged cells are no longer able to arrest and render harmless poisons absorbed from the alimentary canal, or possibly produced elsewhere. They further allege that ascites appears only in the terminal stage of the disease and insist that operative cures in ascites occur only in cases where the peritoneal effusion is the result of chronic peritonitis and perihepatitis. Looking at the subject from a practical standpoint, theoretical considerations must give place to ascertained facts, and it is impossible to ignore the testimony of numerous competent and trustworthy observers who by sight and by touch have verified the existence of well-marked cirrhosis of the liver in cases that have, after operation, not only been cured of the ascitic condition but have for years enjoyed a fair measure of health. Moreover, numerous instances have occurred where a subsequent laparotomy for some other condition has enabled the operator to examine the remote effects of epiplopexy on the collateral circulation and to testify to the remarkable increase of the anastomotic vessels which it produces. The evidence thus afforded, conjoined with post-mortem observations on cases that have run their course without the appearance of ascites, leaves no doubt that stasis of blood in the portal system is the most important factor in the production of cirrhotic ascites.

The operation involves more or less traumatism to the liver, the omentum, and the peritoneum, and, however carefully done, causes some degree of shock. It should therefore, apart from special objections, not be performed on old or on very feeble patients. It is contra-indicated in Bright's disease and in diabetes, but the temporary presence of a small amount of albumin or sugar in the urine may be ignored.

A scanty excretion of urine is nearly always associated with ascites and need not weigh against operation, but if the total amount of urea is very greatly reduced it would, according to some writers, militate against operation on the ground that the liver being the chief centre of the manufacture of urea a very much reduced output indicates advanced hepatic disease. Persistent jaundice, even if slightly marked, and mental hebetude are two most ominous symptoms and the presence of one or both should preclude surgical interference. The same observation applies to serious organic disease of the heart and lungs. Cirrhotic patients are unduly prone to tuberculous disease and special care should be exercised to exclude phthisical cases. Acholia and urobilinuria, if pronounced, are excluded by Talma in his list of objections to operation. He also looks on well-marked xanthoma as an unfavourable sign. The ascites of atrophic cirrhosis is said to be less hopeful than that associated with the hypertrophic type but an analysis of the cases I have tabulated fails to show this. In all cases tapping should be resorted to once or oftener before proceeding to operation. In a small minority of cases this alone will effect a permanent cure of the ascitic condition and in all it will help the operator to gauge the personal equation of his patient.

As to *operative details*, omental fixation enters into every recognised method and is universally conceded to be the most important step in the operation. Additional procedures consist in "rawing" the peritoneal surfaces of the liver and spleen together with the opposed peritoneum lining the under surface of the diaphragm and anterior abdominal wall, with or without anchoring sutures. A variation of the process in respect of the spleen is to create a rent in the parietal peritoneum and effect a subperitoneal displacement of this viscus. Hepatopexy can be easily and rapidly performed through the incision required for fixing the omentum but the spleen is less accessible through this opening and the steps necessary for dealing with it involve so much disturbance that its inclusion in the operative programme is not desirable. If for any special reason splenopexy should be deemed necessary it would be better to perform it through an independent opening and, by preference, on a subsequent occasion. Of the methods of treating the great omentum two in particular have received special recognition. One, the method described by Morison, is to fix its anterior surface by numerous point sutures to the opposed parietal peritoneum previously freshened by vigorous gauze rubbing. The other, devised by Schiassi of Bologna, aims at placing the omentum between the parietal peritoneum behind and the posterior surface of the abdominal muscles in front.

The *results of operation* are as follows. Professor Monprofit, in an exhaustive paper presented to the French Surgical Congress in 1904, tabulated 224 cases of the operation collected from various sources. Of these 84 died within one month of the operation, equalling a mortality-rate of nearly 38 per cent. The writer had collected particulars of 227 cases operated on. Of these 33 per cent. died within one month of the operation, 15 per cent. were failures, 13 per cent. were improved, and 39 per cent. were cured of the ascitic condition. The frequency with which peritonitis occurred after operation suggested that in cirrhotic ascites the resistance of the patient to bacterial invasion was lessened.

Mr. G. GREY TURNER (Newcastle-upon-Tyne) referred to the unavoidable absence of Mr. Rutherford Morison. A record was presented of all the cases that had been operated upon in Newcastle-upon-Tyne since Dr. Drummond and Mr. Morison had their first case in 1894. In all there had been 16 operations and of this number five patients died within a few days, three from pneumonia, one from uræmia, and one from cholæmia. None of these fatal cases had been properly selected. Of the 11 that survived the operation five had subsequently died, at periods varying from four months to six years and three months after operation, thus leaving six patients to be accounted for, and of this number the after-history of five was presented. One patient was well seven years and five months after operation, another was alive but with recurrence of symptoms three and a half years after operation, and three were perfectly well two years and seven months, 12 months, and seven months respectively after operation. 16 cases with only five patients alive 12 years from the date of the first operation did not appear to be a good record, but it was pointed out that of these 16 cases only six fulfilled the conditions insisted upon by Drummond and Morison, and of these properly selected cases three were alive and well seven years and five months, 12 months, and seven months after operation; two lived in good health for five years and two years respectively, in both cases death being due to accident or intercurrent affection; and one case could not be traced. Mr. Turner insisted that the success of the operation depended upon the proper selection of cases, only those suffering from alcoholic cirrhosis who were free from other visceral complications and who had survived one or two tappings coming into this category. Many cases of ascites not due to alcoholic cirrhosis had been cured by the operation, but it was contended that in arriving at a proper estimate of the operation as originally suggested these ought to be excluded, for many of the fatal cases came from this group. In the technique stress was laid on the importance of continuous drainage and strapping. One of the most important questions for discussion was the influence of the operation on the cirrhosis itself.

Mr. JOHN LYNN THOMAS (Cardiff) read a paper on

Enucleation of the Prostate.

The revival of prostatectomy, he said, had proved a remarkable success and as a consequence the last five or six years had seen a sufficient number of operations of the kind from which, as data, to discuss the respective merits of the two main methods of surgical procedure. As this comparison was the point of greatest practical interest he would therefore proceed rapidly to its consideration after a few preliminary remarks upon the diagnosis of hypertrophied prostate. For diagnostic purposes there were only two means by which the character of an enlarged prostate could be determined before operation: (1) palpation per rectum and (2) investigation of the length of the urethra. Where no elongation of the urethra was present the cystoscope might also offer a possible third method of examination but he had not found its use of value in ordinary cases where elongation occurred. Proceeding by these methods it was possible to exclude certain cases of enlarged prostate as unsuitable for enucleation. In what circumstances should the prostate be enucleated? In dealing with this question Mr. Thomas expressed himself in favour of operation as soon as the patient was compelled to face the risks of "catheter life." Notwithstanding a great improvement in the directions now given to patients entering upon "catheter life" the risks still remained so great as considerably to exceed those of immediate operation. Proceeding to a comparison of the results obtained by perineal and suprapubic prostatectomy respectively, Mr. Thomas referred in detail to a large series of statistics which, with the assistance of Mr. A. Clarke, he had been able to compile from English, American, and European records of cases. A total of 677 perineal operations provided 89·8 per cent. cases of recovery, and a total of 583 suprapubic operations 88·9 per cent. In complete cures, however, the suprapubic method showed a greater percentage, 95·6 per cent. against 81·4 per cent. of the cases of recovery after the perineal operation. Thus, although the perineal method gave 0·9 per cent. more cases of recovery the suprapubic method gave 14 per cent. more cases of complete cure. The advantage of the perineal route would seem to lie in the greater ease of drainage. Difficulties of drainage, however, only made themselves felt in the case of the suprapubic operation when dealing with septic cases. With a septic bladder it became necessary to drain the cavity from which the prostate had been removed by an additional perineal incision. Better still, however, was a method more in accord with the canons of general surgical procedure. It was a most valuable general principle to avoid operations through inflamed tissues except in cases of necessity. Deference to this principle involved an operation carried out in two stages. The first step was the performance of a suprapubic cystotomy, the second, removal of the prostate, this not being undertaken until the parts were restored to their normal condition of asepticity. Free drainage by cystotomy was preferable to irrigation and medication of the bladder through the catheter. As to the technique of the operation Mr. Thomas was in favour of a transverse incision of the skin, &c., with vertical separation of the recti. A silver prostatic catheter was passed into the bladder as a guide during enucleation, and as soon as the viscus was opened a special spoon-shaped retractor was used to elevate the prostate per rectum. Mr. Thomas summarised his remarks in the following series of conclusions:—1. That there is no choice between the suprapubic and perineal methods of enucleation so far as the incidence

of mortality was concerned. 2. That either method may be followed by disappointing results, such as stricture of the urethra, urinary or recto-perineal fistulæ, and interference with the sexual functions. 3. That in septic cases enucleation of the prostate should be performed in two stages. 4. That the suprapubic route is more suitable for tumours of the middle lobe, for the removal of calculi, and for the control of hæmorrhage when such complications are present. 5. That the suprapubic route is unsuitable for surgeons with short fingers or flexible nails. 6. That post-mortem evidence fails to justify the contention that enucleation had ever resulted in the complete removal of the prostate. 7. That anatomical evidence was conclusive in demonstrating the impossibility of removing the prostate in one mass without also removing the prostatic urethra.

Mr. GEORGE A. BINGHAM (Toronto) also read a paper on the same subject. He dealt first with the minute structure of the normal prostate, referring in some detail to the structure of the prostatic stroma and its relationship to the glandular elements. Reference was also made to the question of a middle lobe, to the lack of a true capsule, and to the absence of definite lobes. The developmental history of the gland was such as to make evident its purely sexual function. There was no special thickening at the neck of the bladder capable of acting as a specific sphincter. Dealing with the subject of hypertrophy, he emphasised the fact that the majority of prostatic tumours were simple adenomata. In his opinion the normal tissue of the gland was displaced by the new growth and was driven to its periphery, thus giving rise to a pseudo-capsule. The process of enucleation was always performed by separation along some line of cleavage between the different strata of this spurious capsule. Discussing the treatment of hypertrophy, he divided the cases into three classes: 1. Early cases where in an otherwise healthy man the only symptom was obstruction to the urinary outflow. Here removal by operation was advised. 2. Very late cases where kidney or bladder complications forbade a formal prostatectomy and yet some surgical intervention was urgently demanded. In such cases the Bottini operation was of value, performed under a local anæsthetic. When the patient's general condition was bad and complicated by the presence of a calculus, either in the bladder or in the prostate, suprapubic cystotomy was advised under local anæsthesia. When the stone had been removed the Bottini instrument was applied under the guidance of the finger in the bladder. 3. Intermediate cases where the general condition was good but cystitis, calculus, incontinence of urine, prolapsus ani, &c., rendered life a burden. Here the radical operation was advised, the choice of route being altogether determined by the conditions present. Thus when the middle lobe alone was involved and the resulting tumour projected into the bladder the suprapubic method was followed. When, however, the mass bulged towards the perineum and rectum the perineal method was chosen. In the performance of these operations it was essential to pay attention to "ante-" and "post-operative" treatment if good results were to be obtained. In conclusion, reference was made to the treatment of shock and uræmia, the most common causes of death, and to the most recent statistics, which showed slightly more favourable results from the perineal method of operation.

The discussion which followed revealed a very decided preference on the part of American surgeons for the perineal route.

Dr. G. E. ARMSTRONG (Montreal) reported

The Successful Removal of the Spleen in a Case of Banti's Disease.

The patient had recovered full health and strength and the blood had returned to practically a normal standard. A very unusual and interesting feature in his case was the incidence of a condition of tetany coming on about 12 hours after the operation. Painful spasms involving the trunk and extremities continued to occur at intervals for about 40 hours, when they ceased completely. Of 32 cases of splenectomy in Banti's disease 23 recovered and nine died—a mortality of 28 per cent. The larger number of cases occurred between 10 and 40 years of age. The recovery in the successful cases would seem to be permanent, with complete relief from attacks of hæmatemesis and apparently an arrest of the cirrhotic changes in the liver and a return of the blood to a normal condition. Attention was particularly drawn to the enormous dilatation in the splenic veins and the alteration in their walls, leading to stasis and passive hyperæmia of the spleen and dilatation of the vasa brevia and œsophageal veins. It was suggested that the changes in the veins might be one of the earliest lesions and possibly secondary to some alteration in the gastric mucosa. The changes in the spleen would then be regarded as secondary to the persistent blood stasis and hyperæmia. Splenectomy was urged as the proper method of treatment. It should be done before the changes in the liver become pronounced.

GYNÆCOLOGY AND OBSTETRICS.

TUESDAY, AUGUST 21ST.

Dr. A. H. FREELAND BARBOUR, the President of the section, delivered some introductory remarks on

The Relation of Gynæcology to the Work of the General Practitioner.

He said that gynæcology as a specialty was sufficiently in evidence in the programme of work of the section and therefore he devoted the few minutes of his introductory address to the relation of gynæcology to the work of the general practitioner. The medical student started with a wrong idea of gynæcology, for which the term "diseases peculiar to women" was in part responsible. Instead of applying the general principles of pathology to pelvic disease he thought that these had a special pathology. There was no more reason to treat gynæcology as a specialty than obstetrics, which was admitted to be part of the work of the general practitioner. A moment's consideration would show that the great majority of gynæcological cases must be at first in the hands of the general practitioner. The recent remarkable development in operative gynæcology had led to the idea that the surgical aspect of gynæcology was gynæcology itself. But that was only one side of it; it had what he might call its medical aspect also. Gynæcology was not a specialty in the same sense as mental disease or even diseases of the eye. When a case of mental disease presented itself the practitioner at once recognised that here was a case which did not belong to him. And the same was largely true of diseases of the eye. Specialism in gynæcology, apart from major gynæcological operations, was more akin to specialism in diseases of the heart or lung, in which, by devoting special attention to affections of one system and gaining a wider experience in it than fell to the general practitioner, the physician had come to be recognised as an authority on diseases of a given system. From this point of view it might be said that the way to the specialist in gynæcology passed through the domain of the general practitioner and that the specialist was to be called in when the general practitioner recognised that he had not the training or experience to enable him to diagnose or to treat successfully his patients. This view of the subject required a higher standard of knowledge than he at present possessed, and they stood at the parting of the ways. Was gynæcology to be relegated to the post-graduate course, to be studied only by those who had a bias towards it? Or was it to be made an integral part of the student's training, so that at its termination he would know at least the elements of clinical gynæcology? From the relation of the diseases of women to obstetrical work, from the reasonable expectation of the general public, from the very nature of the case it seemed to him that the student must be taught and examined clinically. It should be taught in relation to medicine, surgery, and midwifery, the tripod on which the practice of medicine rested. If these three subjects were represented by three circles side by side gynæcology was a fourth intersecting the three. Specialism was a peak in a mountain range and its development was subject to the same law. A broad foundation must be laid for knowledge, remembering that the height of a hill was related to the breadth of its base. Some rose, like Fujiyamu, abruptly from the plain, volcanic in nature, produced by a sudden outburst of imprisoned force. Such were the geniuses of the medical profession. More usually, however, a peak was produced by a gradual process—for nature was rarely in a hurry—which led to its appearance as a member of a mountain chain. The specialist was slowly differentiated from his fellows like a peak in the Rocky Mountains.

After the President's introductory remarks, Professor ADAM H. WRIGHT (Toronto) read a paper on

Concealed Accidental Hæmorrhage.

He dealt only with that type of concealed hæmorrhage

which occurred in the latter part of pregnancy before the effacement or dilatation of the cervix. Many such cases were overlooked and the condition was more common than was formerly supposed. Five cases had come under Professor Wright's observation and he proceeded to give a clinical picture of the condition, stating that colic was one of the predominant features and that there might be nothing to draw attention to the uterus as the seat of the lesion. The patient was in great danger until the uterus was emptied, but how to empty the uterus was by no means an easy question to settle. Dilatation of the cervix might take as long as two hours and in its attempt the woman might die undelivered. The chief aim of Professor Wright was to show that in a certain number of cases the symptoms were due to shock only and not to loss of blood, and cases were cited to illustrate this view. Reference was made to the treatment by *accouchement forcé*, Professor Wright's view being that it was an extremely dangerous procedure. Treatment by friction, electricity, nitro-glycerine, amyl nitrite, ergot, quinine, rupture of membranes, steel dilators, various kinds of dilating bags, and the vaginal plug were all to be avoided. Professor Wright gave morphine for the shock to the extent of one grain in one hour; the physician's aim should be to give the morphine before profound shock had been established. To the first dose of morphine $\frac{1}{100}$th of a grain of atropine was added. The patient's head should be lowered and the body temperature maintained by the external application of artificial heat. Salt solution should be administered by high enema. Small doses of strychnine, $\frac{1}{30}$th of a grain per hour, were to be given, but large doses of this drug were exceedingly dangerous. By such means as these, the patient was got into a better condition for operation. The operation advised by Professor Wright was vaginal or abdominal Cæsarean section.

Dr. W. S. A. GRIFFITH (London) said that in his opinion the discussion of the treatment of accidental hæmorrhage suffered from being considered apart from that of placenta prævia hæmorrhage, the principles of which were almost the same. Cases might be divided into two groups—those in which the hæmorrhage was little and the danger little, and those in which it was great and the danger great. The first group was common and the second was very rare. The treatment of the second group was that which raised the chief points for discussion, especially in those in which the cervix was tough and undilatable. In this condition Dr. Griffith believed that section of the uterus, especially vaginal, was the best operative method when circumstances permitted it. In cases of multipara with soft dilatable cervix the treatment of Braxton Hicks, bipolar version with normal dilatation, was the safest method and the most easily performed by the general practitioner.

Dr. TEMPLE (Toronto) said that the treatment of accidental hæmorrhage of the concealed variety depended entirely on the gravity of the symptoms. If it occurred at the time of delivery the uterus should be emptied as soon as was consistent with the patient's condition either by version or some other method. If it occurred during gestation and the symptoms of shock were very severe, with the os hard and unyielding, the safest plan was to rupture the membranes, apply a firm pad and bandage over the uterus, give restoratives, and deliver the patient later. He had never seen any case calling for such radical treatment as vaginal or abdominal Cæsarean section.

Dr. MURDOCH CAMERON (Glasgow) agreed with Dr. Griffith that if proper assistance was at hand no anxiety need be entertained about the termination of the case. His treatment was to apply a tight bandage, plug the vagina, give opium, and after the patient had got over any symptoms of shock to induce labour. He had never seen a death from accidental hæmorrhage. On no occasion in dealing with the case should the de Ribes bag be used, nor would he entertain the proposal of Cæsarean section.

Dr. W. GARDNER and Dr. J. R. GOODALL (Montreal) communicated a paper on

Chronic Metritis and Arterio-sclerosis of the Uterus.

From a study of nine cases they were able to distinguish two distinct groups. Chronic metritis was divided clinically into simple and complicated. By simple metritis was meant a clinical entity with the symptoms of uncontrollable hæmorrhage and the physical signs of enlargement of the uterus, thickening of its walls, induration, enlargement of its cavity—all these without loss of symmetry. In simple metritis the uterus alone was involved without participation of the other pelvic organs. By complicated metritis Dr. Gardner and Dr. Goodall meant a uterine condition similar to the above but associated with chronic disease of the appendages, with which the metritis might be primarily or secondarily associated. In their paper Dr. Gardner and Dr. Goodall dealt only with chronic simple metritis, which, as already stated, they divided into two groups. Six of these cases fell into the first group, and to this group they applied the term "inflammatory." To the second group, of which they had had two cases, they applied the term "arterio sclerotic." They then proceeded to give the characteristics of the two groups, their description comprising minute and detailed pathology, which would be published in full with their paper.

Dr. ARTHUR E. GILES (London) read a paper on

A Study of 146 Consecutive Cases of Ventrofixation of the Uterus.

He presented some observations on the operation of ventrofixation, based on a series of 146 consecutive cases, divided into groups as follows: Group I., uncomplicated retroversion of the uterus, 47 cases; Group II., retroversion and fixation of the uterus, 26 cases; Group III., retroversion and diseased appendages, 21 cases; Group IV., retroversion and fibroids, 13 cases; Group V., prolapse, 19 cases; and Group VI., total procidentia, 20 cases. The subject was considered with special reference to three points—viz., (1) indications for the operation; (2) technique of the operation; and (3) after-results of the operation. The conclusions arrived at were as follows: 1. Indications for ventrofixation. Dr. Giles regarded the operation as a valuable one—(*a*) in cases of moveable retroversion of the uterus when pessaries had been tried without success; when the uterus retained its position as long as pessaries were worn but fell back as soon as they were removed; and when the patient elected to undergo radical treatment rather than submit to pessary treatment with its attendant frequent examination; (*b*) in cases where the uterus was held down by adhesions in a position of retroversion; (*c*) in cases where a retroversion was complicated by disease of the appendages; and (*d*) in cases of prolapse and total procidentia. Dr. Giles did not suggest that cases of retroversion in the first group should usually be operated upon but was of opinion that about 5 per cent. of such cases would be benefited by operation. 2. Technique of the operation. Dr. Giles laid stress upon the advisability of treating at the same time, whenever possible, co-existing abnormal conditions: thus cases with endometritis should be curetted; a torn cervix should be repaired; a hyperplasic cervix should be amputated; small or solitary fibroids should be enucleated; prolapse of the vaginal walls should be dealt with by colporrhaphy, perineorrhaphy, or both; and diseased appendages should be treated by conservative procedures or by removal, according to the nature of the case. 3. Results of the operation. Dr. Giles had seen and examined 73 patients at periods varying from six months to eight years after the operation. 12 patients had become pregnant, with 15 pregnancies between them, resulting in nine confinements at full term, five miscarriages, and one pregnancy of seven months at the time of reporting. In no case were there any serious complications with labour. In 10 of the 12 cases the uterus remained fixed in good position after delivery; in two there was partial return of the displacement. Among the 61 cases where no pregnancy followed the uterus remained in good position in 58, or 95 per cent.; in three cases there was a return of the displacement. The abdominal scar gave trouble in only 2, or 3 per cent. of cases; there was one case of scar-hernia, the other being a case of "stitch-abscess." The general condition of the patient showed marked improvement in about 90 per cent. of cases.

Dr. TODD GILLIAM (Columbus, Ohio) stated that he shared Dr. Dudley's objections to ventrofixation. As the pioneer of operations on the round ligament for ventro-suspension he had watched the development of this operation with great interest and from an analysis of many hundred cases a symptomatic cure was a nearly universal result. He claimed that the success of this method was due to the fact that the round ligaments developed *pari passu* with the development of the uterus in pregnancy. No unpleasant sequelæ followed pregnancy or parturition. The uterus was not suspended but anchored, and there was no danger of incarceration or strangulation of the bowel as there was an opening of from seven to nine inches in circumference,

through which the bowel might enter or leave. The operation was simple, efficient, and safe.

Dr. J. WESLEY BOVEE (Washington) said that ventrofixation and ventro-suspension substituted one anatomical deformity for another and that he had abandoned both these operations five years ago. Uncomplicated retroversion gave no symptoms and needed no treatment. Complications were the indications for treatment. Dr. Bovee preferred ligamentous operations to ventrofixation. He dealt with both the utero-sacral and round ligaments and also the utero-vesical ligaments. He preferred hysterectomy to ventrofixation in cases of procidentia after the menopause.

Dr. S. N. HAY (Toronto) always curetted before performing ventro-suspension and if the cervix was elongated it should be amputated as it was likely to worm its way into the axis of the vagina and cause displacement. Dr. Hay expressed surprise that Dr. Giles made no distinction between ventro-suspension and ventrofixation. In Canada the fixation operation was reserved for those cases which were beyond the risk of pregnancy. Dr. Hay had opened the abdominal cavity several times at a period of from two to two and a half years after operation, and always found the uterus still in good position, with the central ligament about two inches long still on duty. In one of these cases the patient had gone through pregnancy and parturition in a perfectly normal manner, the uterus remaining afterwards in good condition.

Dr. E. C. DUDLEY (Chicago) said that after an experience of several hundred cases of suspensio uteri—not fixation—in which the posterior wall of the corpus at a point near the fundus was sutured with catgut to the anterior parietal peritoneum near the bladder, he was able to endorse this operation so far as the correction of the displacement and relief of symptoms were concerned. This operation was not, however, anatomical, while that of Dr. Gilliam was anatomical, and the latter was the one which he (Dr. Dudley) now employed. He admitted that further observations were needed to confirm the claim of Dr. Gilliam. He thought that most of the blame laid at the door of suspension properly belonged to fixation.

Dr. TEMPLE believed that ventro-suspension was much to be preferred to ventrofixation, the latter being an obsolete operation, whilst suspension was an admirable operation, as it in no way destroyed the mobility of the uterus. Abortion rarely followed suspension, whilst it was common with fixation. Before any such operation was performed preliminary treatment should in all cases be followed, such as curetting or trachelorrhaphy, and so on.

Dr. GARDNER said that the importance of treatment of retroversion could not be over-estimated. Pessary treatment often failed for various reasons and by many patients was rejected if a comparatively safe operation was offered as an alternative. Dr. Gardner objected to ventrofixation in the sense of establishing a form of union of the fundus of the uterus with the abdominal wall. He aimed at creating a somewhat slender ligamentous attachment which permitted of a degree of mobility of the uterus. As regards relief from pelvic pain, it was not to be expected that the more permanent replacement of the uterus would in complicated cases relieve this symptom, which was often due to chronic metritis or to cystic or cirrhotic ovaries. The miscarriages which sometimes followed ventro suspension were not the result of the operation but were due to chronic metritis. Dr. Gardner differed from Dr. Giles in the order of operative procedure. When a number of operations were necessary he thought it was best to curette and repair or amputate the cervix and then proceed to plastic work on the vagina and perineum, if indicated, concluding all by the abdominal operation. Of the various plastic operations on the vagina he thought that Le Fort's operation was a very valuable one in suitable cases, such as an extreme degree of relaxation of the vagina in a widow unlikely to marry and past the child-bearing age. There were, however, cases on record of women conceiving and bearing children successfully after this operation.

WEDNESDAY, AUGUST 22ND.

Dr. CHARLES A. L. REED (Cincinnati) made a communication on

Changes in Uterine Fibroids after the Menopause considered with reference to Operation.

The discussion was strictly confined to myomatous and fibro-myomatous growths, to the exclusion of adeno-myomata, the latter being potentially half malignant from the start and liable to become actively malignant. Fibroids were liable to retrogressive as well as to evolutional changes, comprising atrophy, calcareous and fatty degeneration—changes consistent with benignity and with the integrity of the growth. They might, however, become necrotic from pressure or they might be the seat of inflammation and suppuration or more rarely might undergo either myxomatous or amyloid degeneration, changes which destroyed the integrity but did not alter the benignity of the tumour. Too much, then, could not be laid on sarcomatous degeneration. Dr. Reed upheld as correct the statement that fibroids underwent carcinomatous change. Tumours which had a mural or submucous situation tended in general to maintain the menstruation to the age of 50 years or beyond. Dr. Reed cited a case in which it was prolonged to the age of 59 years. Cases in which there was severe recurrent hæmorrhage or in which there was rapid growth of pressure symptoms or signs of suppuration would most assuredly lead all surgeons to advise hysterectomy. But the question of operation upon fibroids during rapid reproductive life could not be solved by set rules. "The practitioner should be governed by the axiom that a fibroid of whatever character was potential only for mischief and that other things being equal it was better out than in the patient." The menopause could not take the place of the surgeon. The idea that a fibroid which had undergone calcareous degeneration had by that change become innocuous, and the hope that all fibroids which could be brought to the menopause would undergo that change was, indeed, the foundation for the let-alone policy which was to-day all too indiscriminately prevalent with the profession. Three cases were cited to show that calcareous fibroids could not be relied upon to remain innocuous. Piquand collected 81 cases of calcified fibroids in which there were 29 accidents due to compression of neighbouring organs, 15 instances of profuse metrorrhagia, and in 18 there was suppuration in the adjacent uterine tissues. An analysis of 26 reported deaths showed five from peritonitis, three from intestinal obstruction, one from retention of urine, one from ureteral compression and consequent uræmia, one from metrorrhagia, one from sudden rupture of the bladder, seven from cachexia the result of interminable suppuration, one from torsion of the uterus, and six in which death was preceded by cancer of the uterus appearing after calcification of fibromata. With regard to the last Dr. Reed seemed to view the cancer as a consequence of the fibroid and again cited a case in support of this contention. In conclusion Dr. Reed stated (1) that the only safe place for a fibroid of the uterus, however small or large, however soft or hard, however recent or old, was outside the patient's body; (2) the menopause was a poor surgeon; (3) certain fibroids of the uterus ought to be relegated to operation without reference to either the nearness or remoteness of the menopause; (4) only in cases in which there was some condition not connected with the tumour itself, and making operative interference a dangerous policy, should the leave-alone treatment be adopted; and (5) patients who chose a waiting policy should be warned of the dangers of taking such a course and should be kept under close and frequent observation.

Dr. J. F. W. ROSS (Toronto) said that having listened carefully to Dr. Reed's excellent exposition of this subject, he rose to enter a protest to his conclusions. It was important that the younger men of the profession should be properly guided, and anything that Dr. Reed wrote was read with interest and looked upon as the dictum of an authority, the word of an author who had written an excellent work on gynæcology. He failed to follow his reasoning when he told them that the safest place for a fibroid was out of the woman, unless he went further and said that a degenerating uterus at the menopause was safer out of the patient's body. A fibroid was only an outgrowth of the muscular tissue of the uterus and not a malignant growth, and very seldom, if ever, did it undergo cancerous change. Cancer often accompanied myomatous tumours, but it very frequently occurred in the uterus at or after the menopause when no fibroid tumour was present. He had never satisfied himself that fibroid tumours produced such irritation as led up to cancerous development. Sarcomatous degeneration of fibroids did occur but not frequently. The removal of a small fibroid from a young married woman was a serious operation. An enucleation was not so unfortunate in such circumstances as total removal of the uterus. Total removal prevented a possibility of motherhood; if after this time the same objection did not obtain, and if then malignant disease developed, it was possible and right to remove the organ. When tumours were growing in spite of the menopause they

should be removed. He agreed with Dr. Reed in much that he said and complimented him on his excellent exposition of the subject.

Dr. H. T. BYFORD (Chicago) called attention to the small number of recorded deaths due to the changes mentioned by Dr. Reed in comparison to the large number of tumours that occurred. Hyperæmia about the tumour and in the mucosa predisposed somewhat to malignant changes, but they did not remove a uterus on account of congestion. Many died without these tumours having been suspected. They knew that the single tumours usually grew fat and underwent myxomatous and cystic degeneration, but the multiple growths were apt to interfere with their own nourishment and did not always grow large, and if still quite small might be watched. If at the menopause the tumours were small they might not grow much, and it then would not matter if they underwent calcareous degeneration—this would be nature's cure.

Dr. WILLIAM L. REID (Glasgow) said that they were restricted in this discussion to treatment of fibroids after the menopause. In certain cases fibroids which had been known to exist before the menopause shrank slowly and practically disappeared after it. In other cases they slowly or rapidly enlarged, due either to degeneration of a cystic sort or to general growth of tissue. In the former case they should be left alone but watched at intervals. In the latter they should be removed as being almost certain to give rise to serious symptoms. The former were hard white fibroids, as a rule, with a well-marked capsule of connective tissue; the latter were soft, very vascular, and usually had no marked line between the tumour and the muscular tissue of the uterus.

Dr. MURDOCH CAMERON said he regretted very much that he was not present to hear the paper read but from the remarks in the discussion he had formed some idea of the points advanced. On one point he was quite assured, in spite of repeated assertions, that true fibroids did not disappear. In many instances the conditions found justified the greatest satisfaction that operation had been performed. His opinion, therefore, was that early operation should be advised. The logical treatment of all fibroids was the same as that for the diseased appendix—that was early removal, when the mortality should be almost *nil*.

Dr. W. GARDNER (Montreal) did not believe that Dr. Reed was so radical in his advocacy of the almost universal removal of fibroid tumours as to include a case such as the following, which he had had the opportunity of watching with the usual medical attendant. This was the case of a woman who became pregnant soon after marriage and as the uterus grew a cluster of sub-peritoneal fibroids appeared on the body of the uterus. This woman had been safely delivered three times. The pregnancy, labour, and puerperium were normal in each case.

Dr. HENRY O. MARCY (Boston) said that each patient was an individual factor. In a general way he approved of the conclusions of Dr. Reed. He reported the case of a patient, aged 78 years, in whom there was a large uterine tumour of 40 years' standing. It was supposed to have disappeared and was certainly not felt in the abdomen. The uterus measured nine inches in depth; it was drawn out and removed. An easy recovery followed. A uterine myoma as a rule should be removed. If ever the mortality exceeded 4 per cent. it was due to faulty technique.

Dr. D. J. EVANS (Montreal) spoke in favour of a conservative attitude in the question of fibroid tumours. He mentioned a case in which a tumour complicated pregnancy at the third month, causing excessive enlargement of the uterus. This tumour was as large as two fists and was situated on the anterior uterine wall. It remained palpable for about two years, when it disappeared within six months, the patient having been delivered at term. He mentioned three other cases with tumours which he had delivered at term without difficulty and the tumours had since given no trouble.

Dr. GRIFFITH referred to two cases of calcified fibroids in old women requiring removal, recorded by him recently in the transactions of the Obstetrical Society of London.

Dr. JOSEPH PRICE (Philadelphia) fully agreed with Dr. Murdoch Cameron as to the treatment of fibroids. He criticised Dr. Reed's conservative treatment and considered that removal of single or multifold fibroids could be easily performed by the vaginal route.

Dr. H. L. REDDY (Montreal) read a paper on

Indications for Cæsarean Section other than Pelvic Deformities or Tumours.

Cæsarean section was advanced by Dr. Reddy as an operation of election in such conditions as eclampsia and placenta prævia. He regarded this operation as capable of being performed almost anywhere and by anyone, provided the rules of asepsis were followed. His own experience was based on 14 cases, 13 of which were successful, the fatal case being one of deformed pelvis and the patient was in a desperate condition; the child was saved. He advocated a more frequent employment of Cæsarean section than was done at present. It was easier than *accouchement forcé*. Indeed, it was almost as safe as an ordinary confinement. In eclampsia the consensus of opinion was in favour of rapid delivery and in such cases where convulsions had set in early, or at full term, and the cervix was not yet dragged up and the os not yet dilated, the question arose as to what was the best means of effecting delivery. There were four methods of rapid delivery. First, Dührssen's cervical incisions; secondly, dilatation by mechanical dilators, such as Bossi's; thirdly, vaginal Cæsarean section; and fourthly, Cæsarean section proper. In the first method there was danger from infection and hæmorrhage and, moreover, it required a practised accoucheur. In fact, it required more assistance than true Cæsarean section. Mechanical dilatation did not mean rapid delivery and led to laceration. Vaginal Cæsarean section had all the objections urged against Dührssen's operation and was still more difficult to perform, whilst abdominal section was simple and easy and practically free from danger. Was Cæsarean section justifiable in placenta prævia? Dr. Reddy stated that it was, especially in placenta centralis. The death-rate of Cæsarean section was to-day from 3 to 5 per cent. and nearly all the children were saved, even in cases of placenta prævia. The following telegram had once been sent to 14 leading physicians in the United States: "In placenta prævia centralis, the patient being a primipara, a child viable, a cervix rigid, free hæmorrhage, surroundings favourable, would you endorse Cæsarean section?" Out of the 14, 11 practically answered in the affirmative, and with this view Dr. Reddy did not hesitate to agree. After comparing Cæsarean section with the various methods of delivery per vaginam, Dr. Reddy asked, Why advise the most difficult operation when the simpler one satisfied every demand? As to objections to opening the peritoneal cavity, they did not exist under proper conditions. As to hæmorrhage, it was not so great as in an ordinary confinement. Cæsarean section was indicated in hypertrophic elongation of the cervix or with a hard os due to scar tissues. Dr. Reddy had operated in this way for this condition. Cæsarean section was the best mode of delivery in cases of valvular cardiac disease with falling compensation and in congestion of the bases of the lungs. He had performed Cæsarean section for this indication. As soon as the uterus was emptied improvement was noticed and was maintained. Moreover, in this case the patient was sterilised to prevent future pregnancy.

Dr. A. MCDERMID (Chicago) stated that he had twice performed Cæsarean section for pelvic deformity, with results favourable to the mother and the child. He had advocated Cæsarean section for placenta prævia, being led to do so by a recent experience in which he almost lost a case of placenta prævia from hæmorrhage, the child dying. Such a case as this might have been saved by the abdominal operation. He regarded Cæsarean section as the best treatment in cases of eclampsia, and agreed with Dr. Reddy in denouncing symphysiotomy.

Dr. MURDOCH CAMERON stated that Cæsarean section was quite uncalled for in placenta prævia but was indicated in affections of the cervix or in fibroids, but even here possibly hysterectomy would be better. Cæsarean section might be required in cases of tumours with the soft part blocking the pelvic cavity. In many cases of eclampsia this operation would possibly save life where the os uteri remained undilated.

Dr. GRIFFITH agreed with Dr. Reddy in his opinion as to particular cases of placenta prævia requiring Cæsarean section. He was very doubtful as to the advisability of performing Cæsarean section in cases of eclampsia, except possibly in the interests of the child, and he was still more doubtful as to its employment in cases of heart failure.

Dr. GARDNER believed that in the list of indications for vaginal Cæsarean section might well be included selected cases of hyperemesis gravidarum in which the symptoms

were very urgent, indicating speedy emptying of the uterus. Rapid dilatation was very apt to tear the cervix at the internal os if not at the external os. The clean incision of vaginal Cæsarean section could be carefully adapted and sutured to secure union without cicatricial tissue.

The Value of the Conservative Treatment of the Ovaries.

Dr. JOSEPH PRICE (Philadelphia) gave an all-round denunciation of the conservative treatment of the tubes and ovaries, stating that to these operations were due a long train of untoward circumstances which comprised repeated subsequent operations, mental instability, and even insanity.

Dr. MARCY said that the late Dr. Buch of Ontario found on examination of 500 insane women, 100 of whom had been operated upon, 70 returned to health and sanity.

Dr. FLORIS F. LAURENCE (Columbus, Ohio) stated that his experience in efforts of conservatism had been unsatisfactory. Three times he had to operate a second time for extra-uterine pregnancy because he did not remove the opposite tube at the first operation. He therefore advocated removal of both tubes whilst operating for extra-uterine pregnancy.

Dr. MANTON (Detroit), speaking from ten years' experience, found that the majority of conservative operations were successful. He had reported 100 cases of conservative operations on the appendages without a death. Most of the patients had been under observation for a year; some of them for seven or eight years. In three a subsequent operation was necessary; five others were reported as "doubtful." 15 per cent. subsequently became pregnant.

Dr. THOMAS S. CULLEN (Baltimore) gave an Epidiascopic Demonstration illustrating the Degenerative Changes in Uterine Myomata, accompanied by a brief pathological dissertation.

THURSDAY, AUGUST 23RD.

The meeting opened by a discussion on

The Appendix Vermiformis in Relation to Pelvic Inflammation.

which was introduced by Dr. T. A. HELME (Manchester). The points on which he invited discussion were the following: 1. That the association of appendicular and pelvic disease is due to contiguity rather than continuity of structure. 2. That the accidental inward direction or pelvic position of the appendix is the chief factor in this association. 3. That the appendix or the pelvic organs may provide the primary source of disease. 4. That appendicitis is a frequent source of dysmenorrhœa and its associated mucous colitis. 5. That association of appendicitis with pelvic disease is the exception and not the rule. 6. That the appendix is not a vestigial structure but a highly differentiated portion of the intestinal tract, and plays an important part in intestinal digestion. 7. That the systematic removal of the appendix during laparotomy for pelvic disease in the absence of evident disease is not justifiable.

The following gentlemen joined in the discussion: Dr. GILLIAM (Columbus, Ohio), Dr. LAPTHORNE SMITH (Montreal), Dr. ARNOLD W. W. LEA (Manchester), Dr. CARSTENS (Detroit), Dr. TEMPLE (Toronto), Dr. LOCKHART (Montreal), Dr. HOLMES (Chatham, Ontario), and the PRESIDENT.

Dr. CUTHBERT LOCKYER (London) spoke on the relationship of appendicitis to pregnancy, its effect on pregnancy, the prognosis of this disease to mother and child, and the treatment of cases in which pregnancy was complicated by appendicitis.

The PRESIDENT gave a lantern demonstration of the Anatomy of Labour which was much appreciated but called for no discussion.

Dr. MURDOCH CAMERON read a paper on Anti-streptococcic Serum in Puerperal Septicæmia. He advocated the use of this serum for certain types of puerperal fever, more especially those in which there had been no great laceration of the soft parts. With respect to the latter he argued that the serum could not be expected to combat the results of traumatism as well as those of infection.

This paper was not discussed.

Dr. EVANS read a paper on the Treatment of Eclampsia, in which he drew attention to Adebohls' operation of renal decapsulation for eclamptic anuria, mentioning successes obtained by means of this operation by Adebohls and others. Helme's lumbar puncture, introduced with the idea of reducing intracranial pressure, had not met with success. The various forms of drug treatment were fully discussed.

Dr. GILLIAM described in detail an Operation for Uterine Displacement.

PHYSIOLOGY.

TUESDAY, AUGUST 21ST.

The Section of Physiology opened by holding a joint discussion with the Section of Pathology on

The Part played by the Nucleus in Nutrition.

Professor ADAMI (Montreal) suggested that the nuclear chromosomes determined the inherited peculiarities of the individual and that by varying amongst themselves they controlled particular conditions. After alluding to the effects of removal of the nucleus the gross and minute changes occurring in the nucleus during the course of cell activities were shortly dealt with, particular attention being drawn to Professor Macallum's researches on the formation of prozymogen from the nuclear chromatin. While in tissues at rest the nuclei underwent shrinkage, they became exceedingly conspicuous in the early stages of cell irritation and in acute degenerations, but in the later stages of cloudy swelling and fatty degeneration they rapidly lost their staining properties and became indistinct. If the nucleus simply contracted or clumped (pyknosis) it might recover its normal appearance, but after complete disappearance of the nuclear chromatin (karyolysis) regeneration of the cell became hopeless. The iron-radicle of nucleo-proteids and also the phosphorus-content facilitated oxidation changes in the nucleus and thereby imparted to the nucleus potentialities superior to those of any ordinary constituent of the cell body. Professor Adami believed that vital phenomena depend ultimately on a special order of molecules which he called biophores, and that the latter were situated in the nucleus, because the vegetative powers of the latter were greater than were those of the cell body. New biophores were supposed to arise under the influence of pre-existing ones by the latter "possessing unsatisfied affinities and attracting side-chains of various ions, simple and compound, from the surrounding media and that the latter became grouped in a manner identical with the grouping present in the pre-existing biophore."

Professor A. B. MACALLUM laid special stress on the absence of inorganic halogen salts; neither potassium nor chlorine was present within the nuclear membrane, the latter acting as a semi-permeable membrane, impervious to inorganic salts but pervious to organic constituents, which by passing into the nucleus were either aggregated there or were perhaps built up in the nucleus into the nuclear structures.

Dr. GUSTAV MANN (Oxford) recognised two distinct processes going on normally in the nucleus, one of which resulted in the formation of the basophile nuclear chromatin, while the other gave rise to nucleolar matter. Ordinary somatic cells during active metabolism resembled male cells in possessing a large amount of basophile chromatin and little or no nucleolar matter, while resting cells resembled the ovum in containing a large amount of nucleolar matter and only little chromatin. To him sex meant a loss of balance between these two nuclear functions and fertilisation merely the re-establishment of the balance. During normal metabolic processes induced by feeding with albumin or any of its derivatives down to the amino-acids, in drosera and in the newt nuclear changes resembling the initial stages of true karyokinesis were induced, the number of chromatin segments in drosera being eight, while ordinary dividing cells contain in this plant 16 segments. Attention was drawn to the reduced number of segments in cancer being perhaps only a special phase of ordinary metabolism. Sulphur seemed to be absent in the nucleus and it was possible by the administration of antipyretics mixed with peptone solutions to retard nuclear activity from five minutes to 30 hours.

Professor E. WACE CARLIER (Birmingham) believed a nucleus to possess reproductive functions quite apart from vegetative functions and restricted the term nucleole to those bodies containing pyrenin. When the tropho-chromatin decreased during nuclear activity the nucleolus increased in amount, to be cast out from the nucleus at the first opportunity—i.e., so soon as the nucleus took up a food-supply from the lymph. He confirmed Haeker's view that pyrenin was effete material, unavailable for nuclear activity directly, though after resolution in the cytoplasm it might become useful. Zymogen was always derived from the nuclear basophile chromatin and never from the nucleolus.

Dr. E. F. BASHFORD (London) stated that from the outset of the investigations of the Cancer Research Fund the work

had proceeded on the basis that cancer was a cell problem requiring to be approached from the experimental aspect. The problem required to be attacked under conditions more favourable than those obtaining in man. Since the entire vertebrate kingdom had been found to be pervaded by the disease, the processes of cell division had been studied under the favourable, the classical conditions obtaining in the amphibia. The so-called heterotypical mitoses had been found to have no existence in fact. In the case of tumours which could be propagated there was nothing to indicate nuclear fusion or fertilisation. The irregular forms of cell division were apparently subsidiary phenomena. What required explanation was the apparently ceaseless proliferation by normal bipolar mitosis in which the normal number of chromosomes was retained. The cell division was, however, only the terminal phase in the growth of the cell itself and was the most evident expression of the more complex problem of cell nutrition which lay at its basis. Thus stated it was not so much the power of ceaseless proliferation as the ceaseless power the cells possessed of nourishing themselves.

The following papers were then read :—

Proteid Nomenclature.

Professor W. D. HALLIBURTON's paper on this subject formed his Presidential Address to the Section of Physiology and he put before the association the joint deliberations of the Physiological and Chemical Societies of England. It is suggested to substitute for the term "proteid," hitherto used in England, the term "protein," as this word is at present used in America and to a certain extent in Germany (Proteinstoffe).[1] Proteins were divided into: (1) protamines; (2) histones; (3) albumins; (4) globulins; (5) sclero-proteins (instead of the word "albuminoid"), including gelatin, keratin, &c.; (6) phospho-proteins, represented by the vitellin-caseinogen group; and (7) conjugated proteins, in which the protein-molecule is united to a prosthetic group: (*a*) gluco-proteins (e.g., mucin), (*b*) nucleo-proteins, and (*c*) chromo-proteins (e.g., hæmoglobin). The products resulting from protein-hydrolysis were divided into: (1) infra-proteins (formerly called acid- and alkali-albumins); (2) proteoses, including albumose, globulose, gelatose, &c.; (3) peptones or substances which could not be salted out from solution, but which still gave the biuret reaction; and (4) polypeptides or compounds resembling peptones, but not giving the biuret reaction. Fibrin being a derivative of fibrinogen and the latter a globulin, it was placed under the globulins. It was finally suggested to continue to use the words: caseinogen, casein, paramyosinogen, and myosinogen.

Tryptic Digestion.

Dr. DELEZENNE (Pasteur Institute, Paris) obtained inactive pancreatic juice by the injection of secretin or by catheterising a permanent pancreatic fistula and then rendered it within a few hours as active by the addition of a soluble lime salt as if it had been acted upon by enterokinase. After the juice had once been rendered active the calcium could be completely removed by means of sodium oxalate without the digesting power suffering in the least. If alkali carbonates and phosphates were removed from the pancreatic juice by means of dialysis, extremely minute quantities of a lime salt were sufficient for activating purposes and lime seemed to be a specific activator inasmuch as barium, strontium, and magnesium had no, or only a very slight, action, which latter might be accounted for by traces of lime salts present in the juice itself.

Dr. S. P. BEEBE (Cornell University, New York), continuing his work on

Nucleo-proteid Immunity,

found it much more difficult to obtain highly active anti-sera to nucleo-proteids than to albumins or globulins, for animals would bear after repeated inoculations only from three to four times the initial dose, especially if thyroid proteids be taken. Highly active anti-nucleo-proteid sera showed in a test tube a specific precipitin reaction, except they be in very high concentrations; they produced very quickly a complete agglutination if very fine fragments of the same kind of organ which was originally used in their preparation be suspended in salt solution. Thus an active anti-thyroid serum would agglutinate in concentrations of 1 in 2 up to 1 in 5 a thyroid emulsion in one second, while it caused no agglutination of muscle, kidney, liver, spleen, or lymph-gland emulsions in half an hour at the same concentration. Anti-nucleo-proteid sera also possessed *in vitro* weak hæmagglutinative and hæmolytic properties (which latter were quite distinct from the precipitin and agglutinin reactions), but these hæmolytic reactions did not occur *in vivo*, there being even an increase of 25 per cent. in the hæmoglobin and in the number of erythrocytes. Inoculation of animals showed an almost complete specificity.

Dr. H. E. ROAF (Liverpool) found minute traces of acid to inhibit the growth of sea-urchin's eggs, while traces of alkali favoured the rapidity of growth, but were likely to give rise to irregularities in the size and shape of the cells.

Professor KEMP (Champaign, Illinois) said that blood platelets contained nucleo-proteid material. They increased at high altitudes even more markedly than the red corpuscles. If the blood plates increased in number during treatment of a severe case of anæmia the diagnosis of pernicious anæmia was excluded and the prognosis was good; in purpura hæmorrhagica the plates were greatly reduced in number.

WEDNESDAY, AUGUST 22ND.

A joint discussion on Over-nutrition and Under-nutrition, with Special Reference to Proteid Metabolism, was held with the Section of Medicine, Sir THOMAS BARLOW being in the chair. This will be found in the report of the Section of Medicine (p. 729).

The Metabolism of Kreatin and Kreatinin.

Dr. FOLIN (Waverley, Massachusetts) said that kreatin was not the immediate precursor of the kreatinin appearing in the urine, for given in moderate quantities with a low nitrogen diet (starch and cream) it was not eliminated at all; given in large quantities (from five to six grains) with a low nitrogen diet about one grain was eliminated unchanged, while if it be given along with food rich in proteid matter 50 per cent. was excreted unchanged in 24 hours.

Chemical and Physiological Studies on Growth.

Dr. MENDEL (Yale University) said that the purin compounds formed in a developing egg were guanin and adenin and mere traces of hypoxanthin. There were always present a number of enzymes engaged in transforming purin-containing material, such as nucleases, amidases, oxidases, uricolytic enzymes, &c. The power of destroying uric acid was but feebly developed in the embryo liver, while it was very marked in the adult liver. Pentose radicles were formed *pari passu* with the purin radicles in developing eggs.

Professor B. MOORE, Dr. ROAF, and Dr. WHITLEY (Liverpool) stated that hydrogen-ions diminished while hydroxyl-ions tended to increase cell-division. Neutral salts showed no toxic effect so long as their osmotic pressure did not almost equal that of the internal fluids. Barium and ammonium were, however, toxic. Phosphates in low concentration favoured growth while in high concentrations they retarded growth.

Dr. REID HUNT and Dr. R. DE M. TAVEAU (Washington) recorded that after introducing various fatty acid radicles into the ethy-oxy group of choline these new compounds were tested physiologically. The acetyl derivative was nearly as powerful as adrenalin but in the opposite direction; it was 1000 times more powerful than choline itself, causing marked fall of blood pressure. Introducing an aromatic radicle gave rise to compounds which raise the blood pressure both before and after atropine. One cubic centimetre of a solution of 1 in 25,000 of phenyl-propionyl-choline chloride would cause a rise of blood pressure and marked slowing of the heart.

Structure and Functions of the Amœba.

Professor C. F. HODGE (Worcester, Mass.) and Professor M. F. DUNCAN (Clark University, U.S.A.) made a communication in which they said that the aim in view was the elucidation of how elementary tissues had become evolved. The neuro-muscular functions in amœba were bound up with a system of fibres which were very delicate at the periphery of the cell and much coarser in the middle. The ectosarc and endosarc of living cells disappeared after fixation. The functions of digestion, assimilation, and growth were in the amœba represented as follows: the zymogen-granules were intranuclear but during digestion passed out into the food vacuoles and there digest such food materials as paramœsia, &c. The contractile vacuoles helped to bring about a circulation of the cell juices and at the same time helped respiration and excretion.

[1] Emil Fischer has now definitely adopted this expression.

PATHOLOGY AND BACTERIOLOGY.

TUESDAY, AUGUST 21ST.

The programme of the Section of Pathology, officially termed the Section of Pathology and Bacteriology, after separating from the Section of Physiology commenced with a paper by Dr. R. M. PEARCE and Dr. H. C. JACKSON (Bender Hygiene Laboratory, Albany, New York) entitled

Concerning the Production of Somatogenic Cytotoxins by the Injection of Nucleo-proteids.

The experiments made were the immunisation of rabbits to nucleo-proteids by the use of washed kidney and pancreas of the dog. The resulting serum was injected into dogs intravenously in doses of two cubic centimetres per kilogramme of body weight. As a control test a serum prepared by injecting cows' pancreas was used. In order to limit the problem sharply attempts were made to immunise with nucleic acids of kidney and pancreas respectively. The resulting sera were found to cause a general disturbance most marked in the kidney. These lesions were therefore the result of a toxic substance having a more or less general action but with especial effect on the chief excretory organ, the kidney. They could not be said to be specific in their action.

The discussion was continued by Professor A. S. WARTHIN (Ann Arbor University). He considered that the facts stated as apparent proof of the specificity of the serum prepared by Dr. Beebe were not sufficient proof that such a serum was specific for the following reasons. An identical delayed toxic reaction was shown in the kidneys of small animals that had been exposed to Roentgen rays for several hours. When examined immediately after the irradiation very slight and transitory changes were found in the kidneys. After a number of days albuminuria developed and a marked condition of cloudy swelling was found in the kidneys. This delayed toxic action might be explained as resulting from the products of proteid disintegration caused by the irradiation. Might not the delayed renal action produced by Dr. Beebe's serum be similarly explained as the result of poisons formed from the action of the serum? Experiments in his laboratory by Dr. Woltmann tended wholly to confirm Dr. Pearce's work. They could produce no specific sera; all were hæmolytic, lymphotoxic, myelotoxic, nephrotoxic, &c., and no specific histological changes could be produced. He agreed with Dr. Beebe as to the variability of reaction shown by different animals.

Dr. W. W. FORD (Johns Hopkins University) contributed a paper entitled

A Consideration of the Poisons present in Amanita Phalloides.

Dr. Ford described the toxicity of the poisonous fungus, the white or deadly amanita, which had caused 300 fatalities from its consumption. With Professor Abel of the Johns Hopkins Medical School, a chemical study of the fungus was carried out. In 1891 it had been discovered that aqueous and saline extracts of the fungus were powerfully hæmolytic, dissolving a variety of corpuscles in great dilution; the agent was considered to be a toxalbumin, this active principle being known as phallin. As, however, the toxicity of these fungi was not destroyed by cooking, other substances than phallin, which was destroyed at 70° C., must be present. Thus, heating extracts of the fungus to 70° and to 80°, destroying their hæmolytic properties and digesting them with pepsin and pancreatin, left behind a highly toxic substance which killed animals rapidly and produced a different pathological picture post mortem. Moreover, Kobert in a later paper stated that there was a third toxic substance present in addition to toxalbumin and alkaloid. In Dr. Ford's work the fungi were identified as Amanita phalloides in the fresh state and collected in the Blue Ridge Mountains of Pennsylvania and their juices obtained in large amounts and evaporated. The precipitate obtained by alcohol was found to contain the hæmolysin; the clear filtrate contained the amanita toxin. The Amanita rubescens contained a powerful hæmolysin for a variety of blood corpuscles, apparently identical with that of the deadly amanita. This furnished the final proof that the hæmolytic substance described by Kobert had nothing to do with the intoxications in man. The lesions produced by ingestion of the fungi were to be attributed, as their pathological character suggested, entirely to the amanita toxin, which was regarded as the active principle of the plant.

Dr. E. F. BASHFORD (London) stated that if Dr. Ford had obtained an active immunity to glucosides it was the first occasion and of fundamental importance as linking the proteids and carbohydrates proper.

Dr. FORD, in reply, stated that animals had been successfully immunised to extracts of Amanita phalloides, which contained poisonous glucosides and in some cases to these glucosides in association with proteid and free from proteid.

Professor W. H. MAINWARING (Indiana University) dealt with

The Application of Physical Chemistry to Serum Pathology,

summing up two years' work on the chemical composition of antitoxic and bactericidal sera by physico-chemical methods in answer to the papers of Arrhenius and Madsen which were published in 1904.[1] The problem was attacked from the aspect of the partition coefficient and the reversible reactions, two physico-chemical laws the application of which had been attempted to serum phenomena; the illustrations were expressed in mathematical terms and numerous diagrams were shown.

Professor R. MUIR (Glasgow) with Dr. W. B. M. MARTIN (Glasgow) contributed a paper

On the Combining Properties of Opsonins of Normal Serum.

The three chief varieties of immune bodies (amboceptors)—viz., those obtained by the injection of (*a*) red corpuscles, (*b*) serum, and (*c*) bacteria respectively—were treated and it was found that in each case the combination of receptor + immune body removed the opsonin of normal serum as tested by an emulsion of staphylococcus aureus. It was shown that a bacterium treated with immune body took up more of the normal opsonin than the same bacterium untreated. It was intended next to test whether the comparatively thermostable opsonin which might be present in an immune serum could be removed by the methods of absorption employed above. In this way information might be obtained as to the classes of opsonins so far as their combining relationships were concerned.

Professor G. SIMS WOODHEAD (Cambridge) was glad to merge his paper in that of Professor Muir as he had only one or two points to raise. He had found opsonins corresponding to complements in cows' milk and also opsonins of a somewhat different character the results of the infection of tubercle.

Dr. G. W. ROSS (Toronto) said that the opsonic power of the blood of newly born children to the tubercle bacillus was about one-half that of the mother, whilst it was about the same in each case to the staphylococcus pyogenes. The practical importance of these observations concerned infant feeding and whether or not mother's milk was essential in remedying this deficiency of tuberculo-opsonic power.

WEDNESDAY, AUGUST 22ND.

Professor R. F. C. LEITH (Birmingham) presided.

Dr. F. J. SMITH (London) contributed a paper with Dr. C. MILLER (London) on

Gastric Erosions,

in which he maintained that the first stage in probably all cases of acute gastritis or gastric ulcer was inflammation of the small collections of lymphoid tissue in the submucous coat of the stomach. Subsequent events—e.g., hæmorrhage, gross ulcer (acute or chronic), perforation, &c.—depended entirely upon the relative power of the inflammation factors *versus* the reparative powers of the mucous membrane of the stomach.

A discussion on the

Etiology and Life-history of Malignant New Growth

was opened by Dr. G. H. A. CLOWES (New York State Cancer Laboratory, Buffalo), in a paper on Experimental Studies in Mouse Tumours. Most important results were obtained by the study of the action of chemical and physical agents on mouse tumours and evidence was detailed of spontaneous recovery from, and immunity against, mouse tumours. Data were presented regarding experiments carried out by Dr. Clowes and Professor Gaylord, the essential points brought out being as follows. Three main types of tumour had been employed: (1) "Jensen," showing 30 per cent. of successful inoculations with slow development and over 20 per cent. of spontaneous recoveries; (2) "Brooklyn" tumour, giving 90 per cent. yield, with rapid development and only

[1] Brit. Med. Jour., vol. ii., 1904, p. 565.

5 per cent. recoveries; and (3) "Spingfield" tumour, which only gave tumours at start by incubation before transplantation and 30 per cent. recoveries. It was shown that tumour cells were far more resistant to chemicals than bacteria, withstanding $\frac{N}{200}$ KCN and $HgCl_2$ at 1 in 2500. Proof of immunity was afforded by the following points:—(1) Spontaneous recovery from true tumours occurs; (2) spontaneous recovery cases are not re-inoculable; (3) there are reduced yields on second and third inoculations; (4) mice with growing tumours fail to take on second inoculation at a different point in the body; and (5) action of serum of recovered mouse on small tumours and on cancer cells. It was shown that immunity was not conferred by injection of tumour cells killed by heat or by chemicals or by nucleoproteids extracted from tumours. Ehrlich's recent theory of cancer was discussed and Dr. Clowes showed that the results of the later work of the New York Laboratory harmonised better with the theory of a stimulating virus. These results could not for the present be applied to human beings.

Dr. BASHFORD described the work of the Imperial Cancer Research Fund. In the mouse 23 spontaneous tumours had been transplanted with 25 per cent. success. The parenchyma of the tumour was the only part that grew on transplantation; the stroma never. Dr. Bashford dwelt upon the absence of any sharp distinction between expansive and infiltrative, or, in other words, simple and malignant growths. An investigation into the statistics of cancer incidence with the Registrar-General showed that there were no increase of cancer and no evidence of endemicity in cancer.

Professor H. R. GAYLORD (New York State Cancer Laboratory) contributed a valuable paper on the evidences that infected cages were the source of spontaneous cancer developing among small caged animals. He found in one year three cases of sarcoma of the rat in one cage in which had been previously kept rats with transplanted sarcoma. There were eight rats exposed in the cage with three positive results. He located one cage in the establishment of a dealer from which in three years 66 spontaneous mouse tumours were found. During this time the stock was completely changed. Again, a second dealer found eight or nine cases of cancer in groups in separate small cages.

Professor EWING (New York) and Dr. S. P. BEEBE gave a preliminary report of a study of the action of salt solution, nucleo-proteid antiserum, susceptible blood, and immune blood upon the cells of the infectious lymphosarcoma of dogs. In some experiments the fluids were saturated with oxygen, in others with nitrogen, and finally in some the blood was changed every 12 hours. The best preservation of cells was obtained by charging the blood every 12 hours and saturating with oxygen, by which means a peripheral layer of cells about the tumour nodule was well preserved for at least 96 hours. Susceptible blood formed a better preservative than immune blood. In salt solution the cells rapidly recovered. Atmospheres of nitrogen were comparatively unfavourable. The former tests were not concluded.

Professor SIMS WOODHEAD regretted that he had been unavoidably prevented from hearing the earlier papers on the subject and expressed diffidence in continuing the discussion. He was so much interested, however, in the later papers that he would make no further apology for intervening at this stage. The points that impressed him most were, first, the promise of further results from the fact that so large an amount of spontaneous tumour growth in mice could so easily be obtained, and, second, the importance of the work founded on the side-chain theory, as expounded by Ehrlich and his school. So far most of their efforts had been directed to clearing the ground and of removing many of those hampering traditions that cling round the question of cancer growth. It was hoped that greater attention might thus be centred on the real and prime factors in this very complex problem. With a large amount of material, during the collection of which some of the factors in the question might be solved, many of those questions as to the difference or likeness of structure and function between cancer cells and normal epithelial cells of various types might be gradually attacked. The specificity of antibodies and the relation of these antibodies to the cells might give us light as to the specificity of the cells. Minute differences in albumins in blood gave specific differences in the form of the antibodies and it remained for them to see whether there might not be equally minute but specific differences between cancer cells and normal epithelial cells. Along these lines they might through the study of function learn something of structure, and of structure learn something of the nature of the altered function of cancer cells.

Professor WILLIAM H. WELCH expressed great satisfaction in the opportunity of hearing these important subjects presented by those actually engaged in the researches on cancer. He expressed the view that the extraordinary observations reported by Dr. Clowes regarding the insusceptibility of cancer cells from tumours of mice to the action of strong germicides, such as corrosive sublimate, the cyanides, &c., could be explained only on the assumption that in some way the germicide was prevented from coming into actual contact with the living substance of the cells, and he referred to his observations on the influence of sublimate in cutaneous disinfection where this explanation applied. Professor Welch called attention to the differences between spontaneous tumours of mice and of dogs, the latter being often complex and even teratomatous. As to the question of the unicentric origin of cancer in Ribbert's sense, the examination of beginning adeno carcinomata of the uterus in scrapings showed often cancerous metamorphosis of groups of cells over comparatively wide areas.

Dr. F. G. BUSHNELL (Brighton) summed up briefly his contribution to the discussion from his observations as a pathologist to a general hospital and expressed his appreciation of the work of those who had spoken and were devoting their lives to cancer research. One feature in the histological examination of normal and abnormal tissues stood out—viz., the continuity in structure which linked up normal and abnormal growth. An analogous condition was seen in metaplasia which occurred in carcinoma of the cervix uteri, in gastric carcinoma, and elsewhere. Thus a study of cancer resolved itself into a study of the laws of growth. This could be carried out from the point of view of (1) structure and of (2) function in biochemical terms. Personally Dr. Bushnell had never yet found one single feature by which the departure of the cell from its specific maintenance of form and activities was to be detected. Even heterotype mitoses which he carefully observed and recorded in 1902 were not essential to cancer structure. As illustrations of the linking-up of tissues were given that of the young trophoblast (chorion-epithelium) which had a striking power of growth and in the early stages of the imbedding of the ovum had physiological relationships which were destructive to the boundary zone. Again, hydatid mole was an excessive proliferation of both layers of the chorionic epithelium. Malignant mole showed a little more overgrowth of epithelium, some infiltration of the decidua and invasion of vessels, but histological distinction between simple and malignant mole might be absolutely impossible. The pure chorio epithelioma might be made up entirely of epithelial tissue and might resemble a "mole" in this respect. The condition was an exaggeration of that of the normal attachment of villi to the decidua in the young placenta. Examples of simple growth becoming malignant were adduced, such as adenoma mammæ becoming carcinoma; melanotic papilloma cutis giving rise to diffuse malignant growth of liver; of a "callus" tumour of the humerus of osteoid tissue following fracture becoming a low type of sarcoma; of multilocular ovarian cysts derived from the follicular epithelium or from germinal cell down-growths in the ovary becoming malignant by an alteration of the distribution and arrangement of its epithelium cells; of fibromyoma uteri which became sarcomatous; and the various cell seclusions and teratomata which gave rise to neoplasms. The study of the functions and activities of cell life was indicated in cancer research. Granulation tissue could exhibit an erosive or malignant character of low or even high type, but it seemed usually of a purposeful though sometimes of an apparently useless function. When the biochemical changes which resulted in granulation tissue were known they might expect to be on the line of the origin of malignant new growth. It was thus he hoped to work.

Professor WARTHIN gave a most valuable demonstration of the Leucoblastomata, illustrated by lantern slides, in which the origin of these leukæmic conditions was discussed and the deposits in various viscera were regarded as metastases from an original neoplasm.

STATE MEDICINE.

TUESDAY, AUGUST 21ST.

The President of this section was Dr. C. F. MONTIZAMBERT (Ottawa), who welcomed the members present in a few suitable words. The proceedings of the day were confined to a

discussion on the questions connected with the prevention of tuberculosis.

Dr. SAMUEL DIXON, Health Commissioner of the Commonwealth of Philadelphia, U.S.A., read a paper entitled

Phthisis Prevention,

in which he detailed a series of experiments extending over the past 17 years in research work: the efforts to find a bacillus which could produce a suitable antitoxin to tuberculosis had succeeded so far as animals were concerned. He stated that the following propositions had been used as his guide: 1. That it was possible that by a thorough filtering of bacilli obtained from tuberculous material a filtrate might be obtained and attenuated so that by systematic inoculations a change might be produced in living animal tissues that would enable them to resist virulent tubercle bacilli. 2. To bring about a chemical or physical change in living tissues that might resist tuberculosis it was possible that inoculations with the bacillus would have to be made, yet before this could be done the power of the virulent bacilli would have to be diminished, otherwise the result would be most disastrous. The dangers which must inevitably result from the direct introduction of the bacillus into the human body led him to labour in the direction of trying to obtain the active principle which would produce immunity. He then proceeded to discuss the relationship between the tuberculous diathesis and nitrogenous metabolism, pointing out that it was confidently asserted that the victims of gout presented a remarkable immunity from tuberculosis, and from this he deduced a possible treatment based upon the introduction into the system of substances containing taurin, creatin, urea, and the like, and more especially the use of a recently discovered drug of vegetable origin called thiosinamin, and further the possibility of establishing a lithæmic habit involving excessive assimilation and metabolism of proteid substances together with increased oxygenation to antagonise the action of the tuberculous diathesis involving deficient assimilation and decreased oxygenation. He then alluded to the work done at the Henry Phipps Institute of Philadelphia, which had been founded for the study, treatment, and prevention of tuberculosis and of the production by men of science of a modified tuberculin. Reference was further made to the experiments of Ravenel, Marmorek, and Cantacuzene with bacilli from dead animals. It was upon the lines thus laid down as a basis for future experimenters that he proposed to continue his search for an antitoxin to tuberculosis and with the magnificent assistance rendered by the State of Philadelphia he was hoping for good results.

The next paper was read by Dr. ROBERTS, medical officer of health of Hamilton, Ontario, a manufacturing town of about 70,000 inhabitants. Dr. Roberts approached the subject under the following headings: (1) responsibility of federal authorities; (2) responsibility of provincial legislatures; (3) responsibility of municipalities; and (4) the individual's responsibility. He based his paper upon the assumption that pulmonary tuberculosis was not an incurable disease and that it could by proper measures be eradicated. He further went on to estimate the number of sufferers in Canada at 40,000 and the annual financial loss to the country at $8,000,000. As regarded State measures he congratulated the province of Ontario on having made a grant of 40 per cent. of the total cost of erecting any consumptive sanatorium and took credit to his own town of Hamilton for having taken the initiative in claiming the grant; he strongly advocated the addition to the Cabinet of a Minister of Public Health in every province of the Dominion. There was unfortunately now a new disease which might be called "phthisiphobia" arising among the public which consisted in a fear that it was not possible to check pulmonary tuberculosis. Such a scare could not be justified by any evidence. It was one of the most pitiable bogies he had ever met with. Dr. Roberts emphatically pointed out that the prevention and eradication of consumption constituted not merely a problem for medical men, but that it involved nearly every social and economical problem of modern life which was awaiting solution. In concluding his paper he spoke at considerable length of his own experience in Hamilton and of the difficulties which he had experienced in obtaining any satisfactory notification of cases of tuberculosis. He fully agreed that the measures which would cure pulmonary tuberculosis would also tend to its prevention and spoke of the need for better homes for the working man, for more holidays of a regular character, and for the eight hours' day.

Dr. GILCHRIST (Nice) then read a paper dealing with

Certain Analogies between Influenza and Pulmonary Tuberculosis,

based upon certain theses which he put forward as follows: (1) both diseases had prevailed in epidemic and endemic forms although in different surroundings; (2) both affected principally the organs of respiration; (3) both diseases were highly infectious and a single attack did not confer immunity but on the contrary rather predisposed to a second invasion; and (4) both diseases showed by rheumatic symptoms and involved by extension the nervous system generally.

Dr. PROBST (Ohio) next dealt with some of

The Disputed Questions in connexion with Pulmonary Tuberculosis

and spoke of the varied phases of its causation. The disagreement by authorities such as Behring and Koch upon the all-important question of infection by ingestion and the dangers more especially of infected milk were dealt with and Dr. Probst then turned to the dangers of bad or tuberculous meat as illustrated by the Chicago revelations. The public were now beginning to believe that pulmonary tuberculosis, instead of being hereditary, was really an infectious disease and had begun to demand almost impossible measures. The exclusion of the known consumptive from the school, the church, the theatre, the concert, the tram-car, the railway-car, and, indeed, from any public assembly, seemed to be a severe violation of personal rights and could not be supported by the medical profession as essential. They ought, however, to insist upon such measures as would prevent dried sputum being thrown upon the wings of every wind and upon the observance of certain simple rules and hygienic conditions. The part played by alcohol in promoting the activity and spread of tuberculosis was still to be ascertained and as there was a vast difference between the use of alcohol and alcoholism there was also the necessity for considerable differentiation according to the status of the patient. It had never been proved that alcohol in and of itself was responsible for the production of tuberculosis. The marked decrease of tuberculosis in civilised countries was to be viewed with satisfaction and most people would ascribe this to the generally improved hygienic conditions, but, on the other hand, this improvement, noted in England, in France, in Germany, and in America, did not extend to Hungary and Austria. In the different countries attention was being paid to different points and it was probable that even if the medical profession had at its disposal $1,000,000 for the prevention of tuberculosis it would know how to spend this sum. In matters of treatment it was the same and no sure course could be agreed upon. The best form of sanatorium, the need for sleeping out of doors in all weathers and all climates, the provision of amusements and even chapels, forced feeding, and the use of alcohol, were all points of disagreement. In conclusion, Dr. Probst pleaded for a better general system of home treatment for consumptive patients.

Dr. HOMAN (St. Louis) presented a short paper on

The Dust Problem as shown in Public Buildings and Private Houses.

Dusting consisted in the mere displacement of dust from one surface to another and not in its removal. He advocated compulsory cleaning by vacuum systems and the more extended use of the damp cloth.

This concluded the reading of papers and a spirited discussion followed.

Dr. GILCHRIST suggested that Dr. Dixon in his remarks upon the relation of gout to pulmonary tuberculosis had mistaken effect for cause. To load a stomach already weakened by a disease which demineralised the whole system was simply to produce an acute dyspepsia. In such cases the primary need was to restore the chlorides of the body by the judicious administration of hydrochloric acid and not to give an excess of nitrogenous foods. He relied more upon the chemistry of the disease and quoted the theories of Gautrelet as to the value of systematic urinary examinations.

Dr. PROBST said that he was almost inclined to think that the discovery of a cure for pulmonary tuberculosis would not be a good thing. People could only be induced to cease the habitual violation of the laws of health by being penalised and in this way the disease had its uses. Cure and prevention of necessity went hand in hand and the real need in both was for healthy houses and sanitary surroundings.

DR. J. BARR STEVENS (Renfrew) related some personal experiences of the value of fresh-air treatment in his own family and explained the methods by which the lessons of prevention were being taught in Renfrew in a popular form.

Professor JOHN GLAISTER (Glasgow) pointed out that the Local Government Board for Scotland had now officially recognised phthisis pulmonalis as an infectious disease and that it was open to local authorities in Scotland to adopt the same measures of notification, isolation, and disinfection, as in the case of other infectious diseases. To some extent this had been done and further efforts had been to educate people by lectures and leaflets. It was also needed that in populous cities more attention should be given to the prevention of smoke and dust nuisances, both of which were the cause of much respiratory disease.

Dr. WOODWARD of the United States Marine Hospital Service gave an interesting description of the Hospital for Consumptives established by the State at Fort Stanton, New Mexico, and of the precautions adopted for the transit of the patients. So far excellent results had been achieved.

The discussion was closed with a most interesting personal reminiscence by Dr. J. GROVES (Isle of Wight) who had himself been a consumptive and who advocated the use of single tents and camps in preference to sanatoriums, which, though costly and very magnificent, did not so fully achieve an open-air treatment. To educate one patient and to cure him was to send out a health missioner to preach the gospel of fresh air and to announce that pulmonary tuberculosis was not wholly incurable. If all consumptives could be taught to lead suitable lives the gain to themselves and the community would be very great.

WEDNESDAY, AUGUST 22ND.

The Protection and Filtration of Water-supplies.

The first contribution to the subject was a paper by Dr. ROBINSON, who holds the position of health officer at Guelph, Ontario. He commenced by giving an outline of the principal factors common to all water problems. The essential points in connexion with every water-supply were continuous sanitary supervision from the moment of installation, regular and periodic examinations of the supply, and suitable treatment of all waters which were, or were likely to become, dangerous. The only practical method of artificial purification upon which reliance could be placed was filtration where large bodies of water were used. In England a filter-bed was, in fact, a closed reservoir suitably underdrained and filled to a height of five or six feet with suitable filtering material. The water flowed evenly and slowly over the sandy surface, leaving most of its sediment and suspended matter on the top. This formed a coating called "Schmutzdeck," which contained not only suspended matter but a gelatinous substance produced by bacterial action. Sand filters, however well constructed when newly installed, required cleaning at frequent intervals, otherwise they would become impervious. A usual rate of filtration would be from two to two and a half million gallons per acre per day, and filters of this kind would cost in Canada about 60,000 dollars per acre, smaller filters costing more in proportion than large ones. The mechanical filter was mainly of American origin and required the addition of a small quantity of some coagulant—e.g., aluminium sulphate—before the water reached the filter. This formed a white jelly-like precipitate in which suspended matters and bacteria were alike entangled. The rate of filtration was as great as 100,000,000 gallons per acre per day and the cost might be estimated at 20,000 dollars per million gallons plus a cost in operating of about seven dollars per million. He considered that either system would be efficient in removing both chemical and bacteriological impurities and that with the American system no less than 98 per cent. of the bacteria could be eliminated, besides which there was greater efficiency in removing colour and turbidity.

In the absence of Dr. HILL (Minneapolis) his paper was read by Dr. WESBROOK, the director of the public laboratories of Minnesota. The paper dealt with the essentials of pure water-supplies and the responsibilities in the matter of every municipality. Dr. Hill urged that it was the duty of the board of health not merely to keep itself informed as to the chemical and bacteriological condition of the water but to advertise the information it thus acquired. The dangers of propagating typhoid fever by means of water were discussed and the measures to be taken in stamping out an epidemic of typhoid fever were very fully outlined. Dr. Hill urged that it was quite as much the duty of the water authorities to supply pure water as it was that of the milkman to supply pure milk and that they with the fraudulent milkseller should be equally liable to penalties.

Mr. HOLTON, secretary to the Vermont board of health, then read a brief paper in which he alluded to the mysterious pollution of artesian wells which might be due to a cause quite half a dozen miles from the boring. He considered that it was practically hopeless to prevent the pollution of the sources of supply and that the only safeguard lay in filtration. The reason of this was that up to the present no law had ever been put into operation to restrain municipal authorities from polluting the streams. In systems of filtration he recommended the mechanical filter for small municipalities as not interfering with the fire service and as being more economical; the prevalence of waste in the use of water was much to be regretted and ought be checked. Since the very life of the citizens depended upon a pure water-supply it was most necessary to supervise the sewerage schemes of all towns and also to keep a careful watch over the working of the filter. Typhoid fever was not the only disease due to water and there were many cases of kidney trouble, &c., arising from the same source.

Professor STARKEY (McGill University, Montreal) gave a most interesting account of the experiments which he had carried out during the last four years with regard to the rivers St. Lawrence and Ottawa, and especially to a portion of the Ottawa at West Mount, Montreal. So far none of these waters would be condemned upon a chemical analysis and he could not even say that bacteriologically they were an actual source of danger. But it could not be denied that the bacteriological evidence of pollution as shown by the increase in the number of colonies per cubic centimetre was steadily on the increase, and this increase constituted a potential danger. He had no wish to be considered an alarmist but it must be evident that this was a condition which could not be overlooked. He then made reference to the epidemic at Winnipeg which arose from water that a few years before had been no worse than was that of the Ottawa or of the St. Lawrence of to-day. Sewage disposal must be reformed and efficient filtration enforced or else such a case as the Ottawa water off West Mount would soon become a serious menace to public health and other places would follow.

During the discussion which followed these papers Professor GLAISTER spoke at some length of the necessity for water-supplies being in the hands of the municipality and not, as too often was the case, the property of companies working for a profit. He was glad to say that water companies were rare in Scotland and now many of the large towns, London excepted, were providing new and pure municipal supplies at immense cost and from great distances. They were insuring the purity of their sources of supply either by purchasing the gathering grounds outright or by acquiring such rights over them as would enable their officers to enter and examine all sources of supply. As to filtration there was one difficulty: it did not remove the discolouration of peaty and moorland waters. The three essentials in protecting a water-supply therefore were: (1) the purity of gathering grounds when acquired; (2) the periodical inspection of sources to detect and prevent fresh pollution; and (3) the regular chemical and bacteriological examination of the supply.

Dr. OLDRIGHT (Toronto) alluded to the freedom of the Muskoka Lakes district from any traces of epidemic disease and hoped that all would use their influence to keep up the preventive measures for restraining pollution which now existed.

Dr. PROBST pointed out that while all States possessed laws restraining the pollution of rivers they were not uniformly enforced. In Ohio the board of health had recently been upheld in an attempt to prevent a city from using a certain water-supply. They must, however, remember that water was not the only cause of typhoid fever.

Dr. T. G. NASMYTH (Cupar, Fife) briefly alluded to the duties of the medical officer of health where river pollution was concerned and regretted that public authorities were hampered by a fear of affecting trade or injuring manufacturing interests.

Dr. BRYCE (Ottawa) said that in his official position he had inspected over 100 water-supplies; he considered that the death-rate from typhoid fever was low in Ontario and this was largely due to the supervision of the sources of

water-supply. There was, however, a need to educate people in better methods of disposing of sewage and refuse.

After Dr. HOMAN had spoken on the legal aspects of the question as illustrated in the dispute between Chicago and St. Louis, the debate was closed by Dr. GROVES in a few words contrasting the conditions prevailing in Canada and in England. He pointed out the powers of the Local Government Board with regard to water-supplies and emphasised the necessity for going back to the primary rock source of supply, which must be protected from pollution.

PSYCHOLOGY.

TUESDAY, AUGUST 21ST.

Dr. A. R. DIEFENDORF (Connecticut) communicated a paper on

The Etiology of General Paralysis

which, in the absence of the author, was read by Dr. A. T. HOBBS (Guelph). Dr. Diefendorf's material was from 172 cases which occurred during seven years (1898 to 1905) in the Connecticut asylum. In this period the percentage of general paralysis to all other forms of insanity did not show any tendency to rise and ranged between 7·8 and 5·4 per cent. per annum. He found, however, that there was a distinct tendency for the number of female general paralytics to increase. He discussed statistically the more specific causative factors and assigned the greatest importance to syphilis, yet he considered that alcohol might be as capable of producing general paralysis as syphilis.

The PRESIDENT (Dr. W. J. MICKLE, London) then opened a discussion on

General Paralysis,

dealing with the delimitation of the disease under the chief headings of (1) symptoms; (2) morbid anatomy; and (3) pathogenetic relations.

Dr. W. ALDREN TURNER (London) referred to the etiological connexion between general paralysis and tabes dorsalis and stated that in his opinion the evidence pointed to syphilis as the great predisposing factor in both disorders, but also suggested that an exciting cause was to be sought for, such as trauma, alcoholism, nervous stress, or possibly, in view of Ford Robertson's researches, intestinal auto-intoxication.

Dr. L. H. METTLER (Chicago) believed that the variable prognosis held in regard to the ultimate outcome of general paralysis was due to the emphasis laid respectively upon the clinical manifestations or upon the pathological findings. He held that general paralysis was another phase pathologically of the tabetic process.

Dr. J. D. O'BRIEN (Massillon) referred to some experimental work which he had undertaken with reference to the bacteriology of general paralysis on the lines of the views formulated by Ford Robertson. He obtained an organism similar to the Klebs-Löffler bacillus in over 95 per cent. of general paralytics, but in other types of insanity in only 2 per cent. Animals inoculated had developed congestive seizures and other physical symptoms of the disease, and post-mortem examinations have revealed lesions similar to those seen in early general paralysis.

Dr. A. T. SCHOFIELD (London) read a short paper entitled "The New Psychology."

WEDNESDAY, AUGUST 22ND.

Dr. C. K. MILLS (Philadelphia) read a paper on

Cerebral Localisation in the Study of Psychiatry.

He started with a brief review of the literature and of personal observations concerning hallucinations and delusions, taking the view that these symptoms, regarded from the psychiatrical standpoint, never occurred as the result of the irritation, instability, or destruction, or combination of these, caused by lesions limited to cortical areas or centres of the senses conditioning these phenomena. The phenomena when they rise to the plane of insane hallucinations require for their explanation disruption or dissociation of the mechanisms which associate not only those centres with each other but with other parts of the brain. He reviewed many personal cases of coarse focal disease and then took up the question of diffuse destructive degenerative disease, such as cerebral syphilis and progressive pre-senile dementia and general paralysis, in which hallucinations and other genuine insane phenomena were present. He referred also to the observations of K. Schaffer and Sœmmerling on lesions of general paralysis in their relations to association and projection areas, and to personal observations on the anatomical and morphological peculiarities of the cerebral surface in cases of paranoia and in low types of brain generally. Here the preponderance of arrest and aberration was most noticeable in the great association regions. He suggested the classification of insanity on the bases of (1) structural arrest or embryonal apotentiality; (2) course and prognosis, especially as conditioned by developmental periods; and (3) election of cerebral mechanisms by exciting causes, bacteriological or toxic.

Dr. JOHN TURNER (Brentwood, Essex) gave a Lantern Demonstration illustrating his findings in the

Central Nervous System of Epileptics.

He held that this disease occurred in persons with a defectively developed nervous system, in whom there was a morbid condition of the blood which showed a special tendency to intravascular clotting, and that the immediate cause of the fits (either *grand* or *petit mal*) was sudden stasis of the blood stream, resulting from the blocking of cerebral cortical vessels by these intravascular clots.

Dr. SPRATLING (Sonyea, N.Y.), was to have given a Kinetoscopic Exhibition of Epilepsy but was prevented owing to unforeseen contingencies; he gave, however, a brief account of the technique of the process and showed one of the kinetoscope films.

Dr. ALDREN TURNER opened a discussion on

Epilepsy

by reading a paper dealing with psychical epileptic equivalents under the following heads: definition and general clinical features; psychical epilepsy and epileptic ambulatory automatism; masked epilepsy; post-paroxysmal psychoses; and varieties of psychical equivalents seen in epileptic mania, impulsions, and katatonic and transitory delusional states. He referred to psychasthenic conditions and the psycholepsy of P. Janet as a paroxysmal equivalent. Inter-paroxysmal "aura" sensations he did not look upon as true equivalents. Reference was made to narcolepsy.

The PRESIDENT dwelt upon the enormous number of mental states of the most varied kinds or forms which occur as epileptic equivalents and also upon the difficulty of diagnosing in some cases between epileptic equivalents of certain kinds and conditions which were part of many cases of epilepsy and, on the other hand, mental besetments or psychasthenic obsessions. He referred to P. Janet's view that psychasthenia generally constituted a mitigated epilepsy—a view from which he dissented.

Dr. MILLS also dissented from P. Janet's views on this point. He thought that a distinction should be made between psychasthenic obsession and epilepsy.

Dr. SPRATLING referred to the extreme rarity of pure psychical attacks without epilepsy—only ½ per cent. of all attacks, while cases of psychical attacks interpersed between epileptic fits, *grand* or *petit mal*, occurred in the proportion of 5 per cent. of all attacks. He considered the dreamy state as over-estimated; it represented in most cases an intellectual aura preceding an attack. With reference to the study of epilepsy he thought that neuro-pathology had had its day. At the Craig Colony they were now searching the body of the living epileptic for the cause of the epilepsy. He looked upon the convulsion as the salvation of the epileptic's mind.

Dr. W. S. SPILLER (Philadelphia) referred to Friedmann's and Oppenheim's attempt to separate from epilepsy certain groups of cases usually classed as epilepsy. He described a case under his observation for five or six years which might be regarded as one of psychic epilepsy but which he considered as belonging to the psychasthenic group of cases.

OPHTHALMOLOGY.

TUESDAY, AUGUST 21ST.

There was an excellent attendance of members when Mr. R. MARCUS GUNN, the President, opened the session with a brief address of welcome. Before commencing the business of the day Mr. Gunn alluded to the great loss sustained by the profession, and by ophthalmology in particular, by the death of Dr. Buller of Montreal.

Mr. J. B. LAWFORD (London) introduced a discussion upon

Rare Forms of Choroiditis.

He especially desired to elicit opinions upon the etiology of

some forms of choroidal disease, rare in his experience, which he proposed to bring before the meeting. The first group contained cases of widespread changes in the choroid closely resembling the disseminated choroiditis of syphilis but in which no syphilitic taint could be found; the second group was a form of choroiditis to which the term "localised exudative choroiditis" might be applied; whilst the third group was "family choroiditis," in which the disease attacked two or more members of a family and presented considerable variation in type.

Mr. A. HILL GRIFFITH (Manchester) mentioned three rare varieties of choroiditis—one a limited choroiditis occurring in company with a descemititis, a second variety of plastic localised exudation, and a third variety commonly known as macular coloboma.

Dr. STEDMAN BULL (New York) had seen a number of cases of localised choroiditis occurring in young persons without any evidence of syphilis. The site of lesion was always near the optic disc or macula.

Dr. RISLEY (Philadelphia) called attention to a group of relatively rare forms of choroiditis which seemed to bear some relation to disease of one of the bony sinuses of the skull.

Mr. ARNOLD LAWSON (London) cited two cases, one of which was an instance of localised choroiditis occurring with a keratitis punctata and limited vitreous change, and the other an instance of bilateral severe choroiditis in a boy the subject of chronic dyspepsia the result of severe pyorrhœa alveolaris. The treatment of the dyspepsia and the teeth effected a very marked improvement in the condition.

Dr. WEBSTER FOX (Philadelphia) mentioned a rare case of choroiditis which seemed to follow an outbreak of cholestesine crystal formation in and about the macular region.

Dr. F. H. VERHOEFF (Boston) read a paper on Obstruction of the Central Retinal Vein, illustrated by lantern slides. He gave the results of anatomical examination of six cases and expressed his belief that all the cases could be explained by the occurrence of an endophlebitis proliferans without thrombosis.

Dr. CASEY WOOD (Chicago) read a paper on Poisoning from Wood Alcohol. The characteristic ocular lesion was an optic neuritis going on to a post-neuritic atrophy and permanent blindness.

Dr. W. M. KILLEN (Belfast) gave a detailed account of McKeown's Irrigating Apparatus for the Extraction of Immature Cataract.

Dr. A. FREELAND FERGUS (Glasgow) read a short paper explanatory of his Method of Testing Binocular Vision.

WEDNESDAY, AUGUST 22ND.

The Section was well attended, the room being crowded, over one hundred members being present at the time. The morning's work was largely occupied by a discussion upon

Sympathetic Ophthalmitis,

which was introduced by Mr. G. H. BURNHAM (Toronto). He took as his text the treatment of the eye sympathetically inflamed and the transmission of the disease from one eye to the other. He advocated the use of the combined treatment during the quiescent period after an injury before symptoms of inflammation appeared in the other eye.

Mr. LAWSON read a paper dealing especially with

The Preventive Treatment of Sympathetic Ophthalmitis.

He pointed out that what was most needed were more authoritative lines upon which a surgeon could base his decision upon the propriety of attempting to save a dangerously wounded eye and which would guide him through the dangers and difficulties which might follow the attempt. Broadly speaking, there was no difficulty in a large number of cases of perforating wounds because the character of the wound and the extent of the injury had utterly destroyed all chances of saving the eye as a visual organ, and it was only in a few instances of this sort that cosmetic reasons would in the slightest degree justify a surgeon in running any risk of sympathetic ophthalmia by attempting to save the eye. But there remained a large class of cases which presented considerable difficulty and which must cause great anxiety. After enumerating and discussing these cases Mr. Lawson went on to summarise the whole matter by putting it in the form of five questions, each of which was discussed in turn. He urged the formation of a committee to inquire into and to collect evidence on the points he had raised.

Dr. J. W. STIRLING (Montreal) confined his attention to the pathological aspect of the disease and pointed out that definite progress had been made in this department during the past year and that a distinct type of traumatic uveitis had been discovered. Further, a bacillus had been found the inoculation of which into the vitreous and circulation of a rabbit had set up a uveitis similar to that seen in sympathetic ophthalmia.

Dr. THEOBALD (Baltimore) was of opinion that congestion and tortuosity of the central retinal vessels, especially those below the disc, foretold commencing inflammation at the posterior pole of the eye, whilst a similar condition of the lower subconjunctival vessels betokened an inflammation of the anterior segment of the globe.

Dr. WEEKES (New York) wished to draw attention to a small-celled infiltration of the uveal tract, and particularly of the ciliary body, that he had noted in five cases in which the disease had arisen after a prolonged period of quiescence. He believed that evidence of threatened sympathetic disease was present when such an eye showed evidence of deep-seated inflammation.

Dr. VERHOEFF thought that recent infection of the scar accounted for some cases occurring after several years of quiescence.

Dr. CONNOR (Detroit) advocated treatment of the disease by large doses of salicylate of soda.

Dr. COLIN CAMPBELL (Toronto) recorded a case in which typical symptoms of the disease arose when the other eye had suffered from a chronic marginal ulceration of the cornea without perforation.

Dr. RISLEY had noted that in cases of true sympathetic irritation the symptoms often seemed to have a definite relation with strain upon the ciliary muscle of the injured eye.

Dr. E. L. JONES (Cambridge) wished to draw attention to treatment of the disease by subconjunctival injections of corrosive sublimate (1 in 3000) and salt solution.

Dr. GORDON BYERS (Montreal) narrated a case of sympathetic ophthalmitis following Mules's operation. The symptoms of the disease first showed themselves a fortnight after operation and a month after the injury.

Dr. EDWARD JACKSON (Denver) read a paper on Accommodation after Middle Life, in which he pointed out that there was no fixity with regard to the accommodative power of elderly people at any particular age.

Mr. FREELAND FERGUS read an interesting paper upon a condition to which he had given the name Sympathetic Degeneration. He had noted that in many cases in which one eye was severely damaged the other eye underwent a degenerative process characterised by a concentric permanent contraction of the visual field. Though loss of sight was often severe the condition never went on to complete blindness.

Dr. HERMAN KNAPP (New York) read a paper on the Dependence of Accommodation and Motility on the Refraction of the Eye, in which he described an intimate correlation between the degree of ametropia and the degree of heterophoria. He went on to detail his method of testing patients.

Dr. A DUANE (New York) criticised Dr. Knapp's assertions and did not think that there was so close an association between ametropia and heterophoria as Dr. Knapp stated.

THE ANNUAL EXHIBITION.

The accommodation provided for the annual exhibition at Toronto was in a series of rooms on the first floor of the main building of the University of Toronto. There were two large rooms placed at the disposal of the exhibitors and a number of smaller ones. Some of these latter were likely to be overlooked, but the exhibition as a whole was very convenient of access and was well attended after the first day. The number of exhibitors was not very large and there were few striking novelties or marked advances in any scientific directions. American firms were numerously represented, Canadian but sparsely, while several well-known British firms sent over interesting and representative exhibits. Special food preparations were numerous, surgical instruments and hospital furniture were fairly well represented, and various publishing firms had stands with copies of recently published works and medical atlases. The electrical and electro-therapeutical exhibits were among the most interesting, and some practical demonstrations were given of the manner of fixing the

apparatus. There was but little display of sanitary apparatus and appliances, and no exhibition of motor-cars as has generally been the case in recent years. Some of the exhibits of firms of druggists presented excellent specimens illustrating the preparation of well-known drugs.

In reviewing the exhibits we may adopt the classification employed in previous years. We propose, therefore, to consider the various sections of the exhibition in the following order: (1) Surgical Instruments and Appliances; (2) Drugs; (3) Foods and Food Products; (4) Sanitary Appliances; (5) Mineral Waters, Beverages, &c.; (6) Publications; and (7) Miscellaneous.

I.—SURGICAL INSTRUMENTS AND APPLIANCES.

The exhibits of surgical instruments and appliances and special instrumental methods of treatment attracted more notice than some of the other exhibits. An interesting and extensive exhibit of surgical instruments was that of E. B. Meyrowitz of New York. These were chiefly instruments employed in the diseases of the eye, the ear, the nose, and the throat. Various apparatus for ophthalmological work were shown, including test cases and ophthalmoscopes. The Meyrowitz Javal ophthalmometer was one of the chief items in this firm's exhibit, and in addition there were instruments for testing muscular insufficiencies and for orthoptic treatment, including the Worth-Black amblyscope, the Derby stereoscope, and the phorometer, tropometer, and clinoscope of Stevens of New York. The transilluminator of Sachs of Vienna was also shown, enabling the interior of the eye to be transilluminated through the sclerotic, leaving the pupil free for observation. A complete outfit for ophthalmic operation was also on view. Various forms of otophone were exhibited; this is an instrumental aid to hearing for the deaf, the apparatus ending in a rubber diaphragm which rests against the ear and is not inserted into the meatus. Apparatus for mastoid and other aural operations were also shown. Some special instruments for operations on the nasal septum were prominently displayed, including those of Freer, Killian, and Ballenger. Messrs. Allen and Hanburys, Limited, of 48, Wigmore-street, Cavendish-square, London, W., and of Niagara Falls, New York, and Toronto, Canada, showed some surgical appliances, including operation theatre furniture and various instruments. Their special operation table of phosphor bronze with patent mechanism for altering the position of the patient, which we described in detail last year, was also prominent among their exhibits. In one of the small rooms of the exhibition was the complete assortment of surgical appliances and aseptic hospital furniture for operation theatres shown by Messrs. Down Brothers of 21, St. Thomas's-street, London, S.E. Patent aseptic tables were shown made of rounded steel tube and supporting glass shelves so arranged as to leave no interstices or corners to collect dust or fluid. Messrs. Down Brothers' surgical hand motor with drills, osteotomes and saws for cranial surgery, various instruments for the operation of bone-screwing, and antrum instruments and various forms of midwifery forceps and of other apparatus for special surgical operations were also in this exhibit. A small glass instrument cabinet for eye instruments was noteworthy, the sides being of opaque glass to prevent the instruments from being seen by patients. The Globe Manufactory Company of Battle Creek, Michigan, exhibited some ingenious and useful forms of apparatus for the fine division of various solutions. The "Globe" multinebuliser enables solutions of different kinds to be nebulised by means of one mechanically controlled pump and could be adapted for inflation of the middle ear and for the application of medicated vapours to the mucous membranes of the air passages. There were also various forms of pump, including an automatically controlled electric air pump and a hand-power pump. Some of the instruments were adapted for vibratory stimulation and massage and the degree of force employed was capable of regulation. This exhibit was an interesting one and practical demonstrations of the mode of working the nebulisers and vibrators were given. The De Vilbiss Manufacturing Company of 1218–1220, Jackson-street, Toledo, Ohio, U.S.A., and Windsor, Canada, showed various forms of atomisers, nebulisers, and powder blowers. The Clark and Roberts Company, of 315, Holton-place, Indianapolis, Indiana, showed some specimens of furniture for wards and consulting rooms, including the specialist's cabinet and chair, made of metal and capable of various adjustments. The Bausch and Lomb Optical Company of Rochester, New York, furnished some microscopes of good pattern and well-finished characters with firm stands and good adjustments. An improved Minot rotatory microtome with several new features possessed good adjustments for varying the position of the object to be cut and for regulating the thinness of the section desired. The J. F. Hartz Company, Limited, of Toronto, Ontario, and Detroit, Michigan, acted as agents in charge of several exhibits, among them the Victor Electric Company's electrical apparatus; for the Spencer Lens Company, Buffalo, New York, who showed some microscopes with a new form of fine adjustment and with automatic lubrication of both coarse and fine adjustments; for the Scanlan Morris Company of Madison, Wisconsin, who exhibited operating and instrument tables with porcelain tops; and for the Leucodescent therapeutic lamp. This was an exhibit of considerable interest. The apparatus consists of a single globe containing the incandescent form of electric lamp with a candle power of 300, 400, or 500. The globe is placed in a conical protecting hood. It is stated that the rays from this lamp form a faithful representation of sunlight and that the heat rays, the luminous rays, and the blue violet rays are all utilised in the apparatus. An interesting exhibit was the high-frequency and x-ray apparatus of the Electro-radiation Company of Boston, Massachusetts. Various forms of coil were shown, such as the "Hercules" and the "Ajax," with x-ray tubes and other apparatus. The Electro-Surgical Instrument Company of Rochester, New York, exhibited various forms of electrically lighted surgical instruments, including cystoscopes, urethroscopes, specula of various kinds, and gastro-diaphanes. The Dowsing Radiant Heat Company of London showed various forms of appliances, including an ingenious instrument, the "Arthromotor," which is an apparatus devised to apply active and passive movements to any joint of the extremities. It is capable of numerous adjustments and the amount and speed of the movement can be readily graduated and varied at will. The Stabbe Therapeutic Lamp Company of 709–710, Omaha Buildings, Chicago, Illinois; Messrs. T. A. Houghton and Co. of 123, Mill-street, Rochester, New York; and Messrs. C. F. Birtman of Chicago, Illinois, exhibited various electrical and electro-therapeutical apparatus.

II.—DRUGS.

At the annual exhibition owing to the never-ceasing labours of the pharmaceutical chemist and the continued succession of synthetic products yielded by the laboratory we may generally expect to find a number of new preparations or of new drugs. This year, however, the number was comparatively few, and more attention is now being given by the manufacturing druggists to the preparation of animal products and of curative sera. Although the number of exhibits dealing with drugs and pharmaceutical products was not large some of the preparations were of considerable interest. The stand occupied by Messrs. Parke, Davis, and Co. of Detroit and of 111, Queen Victoria-street, London, E.C., was of considerable interest as illustrating the application of recent bacteriological research to diagnosis and treatment. There were some flasks of experimental anti-sera which are being tested and are not yet upon the market, including anti-scarlet, anti-typhoid, anti-pneumococcic, anti-dysenteric, anti-gonorrhœal, and anti-streptococcic sera. A number of large tubes, 32 inches by 2 inches, contained cultures of various pathogenic and chromogenic bacteria. The typhoid agglutometer for applying the Widal test for typhoid fever, to which reference has already been made in our columns, was also exhibited. The methods used in the preparation and standardisation of drugs were also illustrated. A new preparation was thyroidectin, the dried blood serum of sheep and goats from which the thyroid gland had been removed, which is now used in the treatment of exophthalmic goitre. Messrs. H. T. Kirby and Co., Limited, of 14, Newman-street, London, W., showed specimens of purgen and of soft glycerine lozenges called glycecols, which seemed to be convenient and useful for the administration of some drugs. Phytin, a non-poisonous phosphorous preparation obtained from plant seeds, containing 22·8 per cent. of organically combined phosphorus, was exhibited by Messrs. Louis Ritz and Co., Hamburg, Germany. Fortossan, a soluble compound of phytin and milk sugar, suitable for infants and children, was shown by the same firm; also Salen, a new salicylic ester for the local treatment of rheumatism. Messrs. C J. Hewlett and Son of 35–42, Charlotte-street, London,

E.C., showed numerous pharmaceutical preparations and proprietary preparations, including the Mist. Pepsinæ co. cum Bismutho. A soluble preparation of iodine, non-irritating, and capable of hypodermic injection, was exhibited by the Burnham Soluble Iodine Company of Auburndale, Massachusetts. A stall was devoted to Antiphlogistine, prepared by the Denver Chemical Manufacturing Company of New York. Some pharmaceutical products of interest were on view in the exhibit of Messrs. Rigaud and Chapoteaut of 8, rue Vivienne, Paris; among them we may mention Apioline, the active principle of parsley, recommended in certain menstrual disturbances; Cerevisine, consisting of pure desiccated yeast cells; and phosphoglycerate of lime. The well-known products of Messrs. Fairchild Bros. and Foster of New York were exhibited, including panopeptone. Among their exhibits were hypodermic injections of trypsin and amylopsin and holadin—an extract of pancreas rich in trypsin, amylopsin, and lipase. Dioxygen, formerly known as Oakland hydrogen peroxide, which was stated to be available for internal use, was shown by the Oakland Chemical Company of 464, West Broadway, New York. Messrs. Allen and Hanburys exhibited their various well-known Bynin preparations, infant foods, and cod-liver oil. Kapsoli were also to be seen; these are a new form of pill inclosed in a thin, soft, and readily soluble jujube coating. Messrs. Burroughs Welcome and Co. of London, Sydney, and Cape Town, presented an exhibit of their well-known tabloid preparations, of the "Wellcome" brand of chloroform, of antitoxin for diphtheria, and of "enule" suppositories. In the exhibit of Messrs. Duncan, Flockhart, and Co., of Edinburgh, the various anæsthetic preparations for which this firm have been so long known were shown, also various forms of special pills and other pharmaceutical products. The useful preparation of Glycothymoline was shown by the Kress and Owen Company of 210, Fulton-street, New York. Messrs. Henry K. Wampole and Co. of Perth, Ontario, exhibited preparations of cod-liver oil, phospholecithin, various terpin compounds, and other special preparations. Various preparations of lactopeptine were on view at the stall of the New York Pharmacal Association, Yonkers, New York, among them the tablets, the elixir, and the elixir with phosphate of iron, quinine, and strychnine. The Palisade Manufacturing Company, of Yonkers, New York, exhibited its preparation Hæmaboloids which are stated to consist of natural iron containing nucleo-proteids, extracted from vegetable structures, reinforced by a synthetic organic iron compound, nutrient albuminoids, the hæmatinic principle of bone marrow, and some nuclein. Tubes illustrating the preparation of these substances were on exhibition. The Charles Phillips Chemical Co. of 128, Pearl-street, New York, exhibited a number of special preparations; among them we may mention the phosphomuriate of quinine and the milk of magnesia, to which we have drawn attention on previous occasions. Nepenthe, the preparation of opium prepared by Messrs. Ferris and Co., of Bristol, England, was shown among their exhibits, also various dressings and "caddies." The "ever-ready" caddy consists of a dust-proof receptable for dressings, so arranged that the required quantity can be readily unrolled and cut off. Messrs. Reed and Carnrick of Jersey City, New Jersey, had on view samples of protonuclein, peptenzyme, pancrobilin, and nephritin, the latter being an extract of the cortex of the kidney. The Abbott Alkaloidal Company, of Chicago, New York, Seattle, and London, exhibited granules and tablets containing a definite quantity of pure alkaloid, glucoside, or other active principle.

(To be continued.)

SALISBURY INFIRMARY.—The annual meeting of the governors of the Salisbury Infirmary was held on August 31st under the presidency of the Earl of Radnor. The medical report stated that during 1905 the in-patients numbered 855 (an increase compared with 1904), the average stay of each in the institution being 20 days. 2936 out-patients and casualties were treated. The financial statement showed that although at the end of 1904 there was a debt on the general account of £3747 and on the building account of £1152, at present there only remained a debt of £1080 on the general account, the building account had been paid, and it was added that for the first time for many years the income had met the expenditure. The Earl of Radnor alluded to the manner in which the medical staff assisted at the recent railway accident, and a special vote of thanks was awarded to them for their excellent services on that occasion.

THE OUTBREAKS OF PLAGUE IN TURKEY.

(FROM THE BRITISH DELEGATE TO THE CONSTANTINOPLE BOARD OF HEALTH.)

SINCE the date of my last letter, which appeared in THE LANCET of August 25th, p. 525, there have been no further cases of plague in Jeddah. The outbreak there seems to have come to an end in the last week of July and fortunately, with the exception of the two imported cases mentioned in my previous letter, there has been no extension of the disease to Mecca. All preventive measures except a simple medical visit have now been removed from arrivals from Jeddah.

Two more cases of plague, making ten in all, have been reported from the prison at Trebizond. The ninth occurred on August 18th and then, after an interval of 11 days without any fresh cases, a tenth was reported on the 29th. It appears that, in spite of urgent recommendations to evacuate the whole prison if possible, and if that were impossible to remove at least the prisoners from the infected ward, no measure of the kind was taken until August 20th, when 196 prisoners were transferred to the mosque of St. Sophia; but it was not until the 25th, or 19 days after the appearance of the disease, that the prisoners occupying the infected ward were transferred to another. Later reports state that the total number of prisoners in the prison was between 400 and 500 and not over 700, as at first stated, but the authorities themselves admit that the prison was crowded and insanitary. Preliminary reports have been received from the two bacteriologists sent to Trebizond from Constantinople; bacilli resembling morphologically the plague bacillus were observed microscopically in one of the earlier cases and those isolated from the last case not only gave characteristic cultures on gelatin but also, when inoculated into guinea-pigs, produced characteristic lesions in the organs from which the same bacillus was obtained.

At Adalia, on the southern coast of Asia Minor, two suspected cases of plague have been recently observed. The first case to which attention was called was seen on the evening of August 24th. The patient was a grocer ("épicier"), aged 29 years, living in the Tashlik quarter of the town. He was said to have fallen ill on the morning of the 23rd. The symptoms, as briefly described in the telegrams, were those of an acute attack of bubonic plague, with the bubo in the left groin. He died at 9 P.M. on the 24th. On inquiry it was then found that a female servant in the same house, aged 20 years, had been taken ill seven days previously with high fever and other suspicious symptoms. When examined this patient was found to be convalescent but there was still a suppurating bubo in the groin.

In consequence of these cases a quarantine of 48 hours, with disinfection and application of the circular concerning rat destruction, was imposed against Adalia; and, no fresh cases having occurred in the interval, these measures were reduced on the 4th inst. to simple medical visit, with disinfection and application of the rat destruction circular. Nothing is known as to the origin of the infection in these cases. It will be recalled that a small outbreak of plague occurred in Adalia in the months of July and August of last year, and then, as now, their origin could not be traced. It is stated that the infected house is situated far from the sea and that the man who died was a poor grocer having no direct relations with importers from Egypt or elsewhere. It is added, however, that in a ditch behind the infected house some ten dead rats were discovered. It is also stated that the female patient had recently put on a dress that had belonged to a woman who suffered from plague in last year's outbreak, to whom she was related, and that this dress had been carefully hidden to avoid its being burnt with the other contaminated effects. The fact, if it be a fact, is of interest, though it would seem more logical to suppose that if the present cases were due to a revival of last year's infection the infective material has been kept alive by a succession of rats than to assume that it has lain dormant for a year in the folds of a dress. A bacteriologist has been sent to Adalia from Beirut to investigate the nature of the disease.

Constantinople, Sept. 6th, 1906.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 15, 1906.

"Return" Cases of Scarlet Fever.

RATHER less than a year ago we commented on a report issued by the Metropolitan Asylums Board on the subject of "return" cases of scarlet fever and diphtheria—cases, that is to say, which arise owing to infection conveyed by patients discharged as cured from the hospitals over which the Board presides.[1] That report was drawn up by Dr. A. G. R. CAMERON on the basis of returns extending over a period of 13 months, and embodied certain suggestions calculated to diminish risk from this source of infection. The period of time covered by the report was, however, obviously insufficient to allow any very certain conclusions to be reached, and we expressed the hope that further investigations would be made into a matter which so deeply concerns the welfare of the community. We are glad to see that this view has commended itself to the authorities of the Metropolitan Asylums Board and that the results of further study of the problem are now available. The present report is written by Dr. F. M. TURNER, the medical investigator for the Board, and is distinguished by the same industry and ability which characterised Dr. CAMERON'S work. Unfortunately, although the figures for three years are analysed, thus affording a more trustworthy statistical basis, the practical conclusions reached are no more encouraging than those of the former observer. Indeed, the result of the present investigation is to contradict or neutralise some of the conclusions which the earlier series of figures appeared to warrant.

Among the principal points emphasised in Dr. CAMERON'S report were the following two—that a large proportion of so-called "return" cases were in reality the result of mere coincidence—instances of purely accidental outbreaks of scarlet fever in houses to which cured patients had recently returned from hospital; and that in the majority of cases in which infection had really been conveyed by the discharged patient rhinorrhœa had been a feature of his attack, such nasal discharge being, therefore, the probable means by which infection was carried. The fact that "return" cases were most frequently met with in autumn and winter seemed to favour this mode of infection, as suggesting that a chill with consequent increase of coryza might have been contracted as a result of exposure to the cold outer air. Dr. TURNER has carefully tabulated statistics of 1000 consecutive cases at the Eastern Hospital, at which a careful record was kept of all cases showing rhinorrhœa, and he finds that while among 397 cases without complications of any kind 3·27 per cent. caused infection on returning to their homes, among 343 cases with rhinorrhœa only 2·62 per cent. proved infectious. Among 256 cases with other complications only 1·54 per cent. caused further outbreaks. The figures certainly appear to negative the suggestion that sufferers from nasal discharges are those most likely to convey infection. On further scrutiny of the figures there is, however, one point at least which deserves consideration in order that we may be sure that we are not drawing erroneous inferences. Thus it appears from the tabular statement showing the dates of discharge of the 1000 cases used for this inquiry that, whereas the "return" infectivity rates for cases without complications or with other complications than rhinorrhœa discharged after less than eight weeks' detention were respectively 3·6 and 3 per cent., cases with nasal discharge similarly treated showed a percentage of over 6·6 "return" cases. The low proportion of infective cases among the whole number of cases of rhinorrhœa may be due to the fact that no less than 180 patients who had exhibited this complication were detained in hospital over ten weeks, by which time the nasal infection had very probably become attenuated. In view of these considerations it would seem at all events premature to discard Dr. CAMERON'S warning as to the special danger attaching to these cases, at all events when they are discharged from hospital after only a short period of detention. It is to be regretted that at present the causal organism of scarlet fever is unknown, so that bacteriological examination cannot afford any assistance in determining the presence or absence of infection. It is remarkable, however, that in the case of diphtheria, in which the bacillus is easily found, insistence on a free bill of health from the bacteriologist has not tended to lessen the number of "return" cases arising at the institutions enforcing this method of precaution. Another feature of this recent report which is the reverse of reassuring is the practical contradiction of Dr. CAMERON'S contention that a large number of "return" cases of scarlet fever are pure coincidences. It thus appears that the public danger from discharged cases of this disease is very real. On the other hand, it must be borne in mind that at the present day scarlet fever is a comparatively mild ailment—it has even been suggested by Dr. L. C. PARKES that it might safely be treated as measles is, the patients not being removed to isolation hospitals. Dr. TURNER'S figures do not tend to support the belief that the mortality of "return" cases is greater than that of other patients, a suggestion that was in any case contrary to probability on theoretical grounds.

A somewhat curious point in which the present report is in agreement with the former is that a larger proportion of infecting cases is found among those patients who are detained for periods varying between eight and 12 weeks than among those whose stay in hospital is either shorter than eight or longer than ten weeks. It is legitimate to suggest that the reason for this peculiarity is to be seen in the fact that cases discharged in less than eight weeks are instances of mild infection, in which the power of contagion is also mild, while, on the other hand, a detention of over ten weeks usually gives time for the infective agent to die out. Another point in which the two reports are in accord is in uprooting the ancient belief in the special contagiousness of the peeling stage of the disease. We read in the present report: "The above figures are, therefore, what we should expect if late desquamation has no relation to power of conveying infection. If any such connexion exists it must

[1] THE LANCET, Nov. 18th, 1905, p. 1487.

be insignificant in amount." It is, however, unfortunate that while taking away this old criterion of infectivity our more recent mentors supply no other test to take its place. The difficulties of investigating in this direction are, however, very considerable in view of the multiplicity of fever hospitals and of the necessarily promiscuous manner in which cases from any one district are sent to one or another of them according to the existence of vacant beds. "Return" cases from one hospital are thus often sent to another, and the difficulty of tracing sources of infection is greatly increased. We congratulate the able medical officers of the Asylums Board on the extent to which they have overcome the difficulties presented, and hope that the subject of "return" infection may continue to receive attention at their hands in years to come. The matter is one upon which the public requires precise medical guidance.

A Medical View on Facilities of Transit.

THE attention of the summer meeting of the British Association for the Advancement of Science was not strictly confined to the class of questions which would at first sight appear to be suggested by its title: it was extended to some which fall rather within the domain of sociology, and many of these had sides of medical interest. Considerations relating to density of population upon urban areas, and to the means by which the ordinary effects of such density may be diminished or controlled, are matters that are now being daily discussed by sanitarians of all sorts. At the meeting of the Association a paper was read by Professor E. MAHAIM upon Cheap Railway Tickets for Workmen in Belgium, another by Dr. LYNDEN MACASSEY on the Distribution of Population by Facilities for Rapid Transit, and a third by Mrs. (or Miss) MARY E. WOOD on Industrial Betterment, all dealing with one or another aspect of locomotion as a remedy for overcrowding and for the many sanitary and social evils which it involves, and the information given and views expressed might be considered with advantage by many of our own municipal authorities, within whose several boundaries these evils are more or less conspicuously apparent. It is necessary to speak with all reserve when comparing conditions practically known to us with others which are known only by description; but, subject to this reservation, it certainly appears from the account given by Professor MAHAIM that Belgium has at least approached an entirely satisfactory solution of one of the greatest social problems of the day. The railway companies in Belgium have seen their way to the institution of cheap trains for workmen to and from all parts of the territory, and for these trains weekly tickets are issued at very low fares. The weekly ticket for six daily return journeys costs less than one ordinary third-class return ticket, and the average length of each journey in 1904 was about 11 miles. The average fare was 12 centimes or less than five farthings of our money. The system was established in 1869 and at first progressed but slowly. In 1888 the number of weekly tickets sold was 11,000,000. It reached 21,000,000 in 1895, and 53,000,000 in 1905, when it was estimated that the tickets were used by one-sixth of the total industrial population. The practical effect is said to be that the country is rapidly becoming a single market, in which distances have no effect upon the price of labour. Moderate rents and other advantages, such as gardens with vegetables, have retained many town workers as dwellers in country districts, and town rents have been kept down by country competition. It is urged that the workers who travel to and fro every day avoid the promiscuous intermingling of the sexes which is so frequent a consequence of urban overcrowding, that the cheap trains tend powerfully to educate the travellers, and to promote the mobility of labour and the possibility of finding work in times of local slackness, as well as to equalise competition. Obviously they also afford to the sick the means of seeking an improved environment.

If we contrast this description with the state of things existing around us in London—and the problems in London may be regarded as the exaggeration of problems existing in other centres—the comparison cannot be said to be to our advantage. It is necessary, of course, to remember that the numbers to be dealt with in London are vastly larger than in Belgium, and that our suburban railways, besides being already taxed to the full extent of their powers, have been constructed at a cost relatively so enormous as to be prohibitory of very low fares. We have, therefore, to deal with different primary conditions. Not the least important of these would be the distance to be travelled in order to reach localities in which the price of land and other conditions would be such as to promote the construction of workmen's dwellings. The London County Council from the time of its first institution has been eager to afford facilities for industrial locomotion, and it may be doubted whether its more ardent spirits have always retained sufficient respect for the rights and the property of railway shareholders, who, there can be no question, have more than once had reason to congratulate themselves upon the protection afforded to them by Imperial Parliament. But, within wide limits, Parliament has allowed the Council to have its own way, and, judging by the present position, the wisdom which has presided over its decisions is not always apparent. The Council has set up a tramway system, the working of which may at present be studied in the southern and south-western suburbs, which are served by frequent cars running from the principal bridges and propelled by electricity on the "conduit" system. The lines for these tramways have been laid along the old coach roads, by the sides of which, for miles out of London, there still exists, an unbroken succession of dwelling houses of good construction, ranging in kind from stately mansions with large grounds to modest villas, worth in the days of their prosperity perhaps £150 a year. As an incident of tramway construction the whole of this roadside property has been depreciated to an extent the total of which could only be stated in millions, and it is depreciated as far as can be seen for every conceivable purpose. On many of the suburban roads two out of three of the comfortable houses which fringe them are to let, and there is no

probability of their ever finding tenants. The medical profession is taking its share in putting down the value of this property by warning intending tenants solemnly against it. The noise of the tramway service is deafening and it is incessant. The creak and rattle and roar of the cars are only varied by the loud and discordant jangling of their gongs. The cars run from daybreak until midnight without intermission; indeed to certain points they run all night through at half-hour intervals. Facilities of transit, when they mean a fluid population and a rapid interchange of labour, are enormous blessings—their medical significance can be seen at once; but if the result of scientific endeavour towards such ends is the creation for a long period of an uninhabitable belt, the future uses of which it is impossible to foresee, medical men and sanitarians will all conclude that our recent endeavours have not been on the right track. For neglected, depreciated, and uninhabited house-property soon becomes a veritable nidus of disease and crime.

The Mortality of Children from Overlying or Accidental Burning.

A CONFERENCE was held late in the summer, it may be remembered, under the presidency of the Earl of ANCASTER, between some members of the executive committee of the National Society for the Prevention of Cruelty to Children and a deputation consisting of members of the Coroners' Society and of the British Medical Association. The subject of the conference was the frequency of deaths among infants from overlying or from accident arising out of neglect on their parents' part to guard them against the perils of fire. We referred in THE LANCET recently to the question of the prevention of overlying (a term which we venture to prefer to the obviously incorrect "overlaying" usually employed), and we have upon many occasions urged upon the consideration of legislators that the deaths of children occurring through their being left alone in rooms with unguarded fires is a matter with which the law might well interfere. There is no need for us to insist upon the importance of these topics in the eyes of all humane persons, and we are more concerned at present in considering possible remedies; but it may be useful to mention that, looking back upon the last six years, in 1903 there were 1619 deaths among children going to bed with their parents and 1660 in 1904, and that the returns made by 200 coroners show that within their jurisdictions 1634 children were burned to death in the years 1899 and 1900, 1425 of these cases occurring where there was no fire-guard. What are the remedies that have been proposed? Suggested legislation we find generally takes the form of additions to the existing law relating to cruelty to children, making it criminal exposure or neglect of a child to leave it in a room with an unguarded fire or to take it into the bed of its parents. We also find that, when the Act dealing with cruelty to children which is now in force was passed in 1904, Mr. BENJAMIN WAUGH, of the National Society for the Prevention of Cruelty to Children, tried to get included in it two clauses or subsections as follows: "The offence of 'exposure' shall further include the leaving of a child alone in a room with an unprotected fire," and "The offence of 'exposure' shall further include the perilous overcrowding of any infant in bed or the going to bed drunk with any infant." These clauses were, however, struck out, presumably in the face of opposition in Parliament, emanating from persons afraid lest the poor should be exposed, by their insertion, to penalties for offences due only to their poverty. Opposition on such grounds was reasonable, but the difficulty might have been got over.

At the conference of which we are writing Mr. C. L. ROTHERA, the coroner for Nottingham, suggested similar legislation to this but upon slightly different lines, making, so to speak, the starting point of criminal proceedings the death of a child upon whose body an inquest has been held, and whose death should be found to be due to either of the two causes referred to. The sections which he proposes should be added to the existing law run as follows:—

1. Whenever upon an inquest taken upon the body of a child under three years of age it is found by the jury that death has been caused by suffocation while the child was in bed with its parents or other adults, and that the suffocation was not the result of natural causes or of the presence of any foreign body in the throat or air passages, such finding shall be evidence that such parents or other adults have neglected such child in a manner likely to cause unnecessary injury to its health within the provisions of Section I. of the Cruelty to Children Prevention Act, 1904.

2. Whenever upon an inquest taken upon the body of a child under ten years of age it is found by the jury that death has been caused through (*a*) burns sustained by the clothing of the deceased child taking fire at an open fire-grate, or (*b*) by scalds caused by the child having access to any vessel of hot liquid on the bars or hobs of an open fire-grate, the absence of an efficient fire-guard around such fire-grate shall be evidence of neglect on the part of the parents or other persons having the custody for the time being of such child under Section I. of the Prevention of Cruelty to Children Act, 1904.

The conference appeared generally to be in favour of legislation, but no definite opinion was expressed upon the relative merits of the two possible courses above indicated, and those present were fully sensitive of the difficulties attending legislative interference with the domestic privacy of the poor. We would point out that the proposition, which limits such interference to those cases in which an inquest is held, may result occasionally in the punishment of dangerous neglect of small children, but that its effect to *prevent* such neglect will be indirect only, uncertain, and slow. There would also be no punishment in the case of injury by burning, or of any injury by overlying, not resulting in death.

A proposal, however, to make the neglect punishable whenever detected implies inquisitorial methods which will be distasteful to some, and it will also be met by the objection that such an enactment would press hardly upon the very poor who cannot afford separate beds for their infants or to provide even the most rudimentary kind of fire-guard. We are not so sure that these arguments should carry weight. The ingenuity and industry of sober, kind-hearted, and hard-working parents, however poor, will generally be found equal to the task of devising some kind of crib or box for the baby with enough covering to maintain its warmth, though at the expense of a little self-denial to themselves; and we have little doubt that manufacturers could soon meet the demand, which does not now exist, for a fire-guard suitable for the poor. With the parents who are not sober, not kind-hearted,

and not hard-working we need have no excessive sympathy if their failure to make any attempt to protect their children from obvious risks attracts the notice of the law. Further, we do not believe that those who would be called on to enforce any new provision of the law would allow it to press heavily upon the good citizen. We are only afraid that they would enforce it too lightly against the undeserving. In Germany, at any rate in some parts of Germany, there is a law that no child shall sleep with its mother. In many cases in which an answer of *non possumus* is given as a reply to a demand for sanitary and other reforms consideration of the example of other countries forms a valuable guide in estimating the possibility of the improvement at home. We are a little too ready to forget that we are not the only nation in the world which has to amend its laws in order to keep pace with the developments of modern civilisation.

Annotations.

"Ne quid nimis."

TRANSMISSION BY POST OF PATHOLOGICAL SPECIMENS.

THE Postmaster-General has recently revised the regulations governing the transmission by post of deleterious liquids and substances sent for medical examination or analysis, and on and from Oct. 1st such specimens may be sent by letter post, without registration, by qualified medical practitioners and qualified veterinary surgeons under the following conditions:—

1. That they are addressed to a laboratory or institute, public or private, or to a medical practitioner or veterinary surgeon within the United Kingdom.
2. That they are inclosed in a receptacle hermetically sealed, which receptacle must itself be placed in a strong wooden, leather, or metal case in such a way that it cannot shift about and with a sufficient quantity of some absorbent material (such as sawdust or cotton-wool), so packed about the receptacle as absolutely to prevent any possible leakage from the package in the event of damage to the receptacle.
3. That they are conspicuously marked "Fragile, with care," and bear the words, "Pathological specimen," and also the signature and address of the medical practitioner or veterinary surgeon who sends them.

The packet must on no account be sent by parcel post. Any packet of the kind found in the parcel post, or found in the letter post not packed and marked as directed, will be at once stopped and destroyed with all its wrappings and enclosures. Any person who sends by post a deleterious liquid or substance for medical examination or analysis otherwise than as provided by these regulations is liable to prosecution. It is recommended that if receptacles are supplied by a laboratory or institute to medical practitioners or veterinary surgeons they should be submitted to the General Post Office, in order to ascertain whether they are regarded as complying with the regulations.

VIVISECTION IN GREAT BRITAIN AND IRELAND.

THE return recently made by the inspector (Professor G. D. Thane) to the Home Secretary upon experiments on living animals is of a nature to carry comfort to the minds of all reasonable folk, whether their leanings are more pronouncedly scientific or humanistic. On the one hand there is evidence of good experimental work in progress, and on the other there is convincing proof of careful prevention of cruelty. To the antivivisectionist, of course, such a return is sorry reading. That experiments upon living animals should be permitted at all is to him so monstrous that he can only regard the merciful circumstances of modern research with impatience. We may leave him on one side, however, while we recognise gladly the increased use of careful and humane experiment, which goes hand in hand with the more widely recognised need for such work on the part of those responsible for the public health of the country. Several county councils and municipal corporations have their own laboratories in which bacteriological investigations are carried on, including the necessary tests on living animals; many of them have arrangements by which similar observations are made on their behalf in the laboratories of universities, colleges, and like institutions. The Board of Agriculture, too, has laboratories which are registered for the performance of experiments having for their object the detection and study of disease in animals. A large number of the experiments alluded to in the report were made on behalf of official bodies with a view to the preservation of the public health. To any unprejudiced reader of the tables which are included in the inspector's report it is quite plain that licences and certificates are granted only on the recommendation of persons of high scientific standing and that the licensees are fitted by their training and education to undertake the various investigations. Of the experiments performed without anæsthetics the vast majority are mere inoculations or the abstraction of a minute quantity of blood for examination. They were, in fact, such procedures as are in common use upon the persons of human patients, in whose case, however, they are not distinguished by the title of "vivisection experiments."

THE STATISTICS OF THE UNEMPLOYED: AN INTERESTING POINT.

THE problem of the real cause and actual extent of unemployment, now so prominently under discussion, is mainly a social, economical, and political question, but its public health aspect cannot be ignored. A correspondent has recently contributed to the *Times* an interesting article on this subject in which it was asserted that whereas, in consequence mainly of the steadily maintained decline in the birth-rate, the proportion of adults in the English population had increased considerably during the twenty years 1881–1901, the proportion of workers for their support had decreased during that period. This conclusion was based upon statistics derived from the reports on the censuses in the above-mentioned years. As a matter of fact, the householder's schedule used at those censuses required no statement as to whether an individual was in or out of employment at the time of the census, and the reports therefore can throw no direct light upon the question of unemployment. They do, however, show the number and ages of persons stated in the schedules to be following any definite profession, trade, or occupation; they also show the numbers of children and adults not stated to be following any definite occupation, or stated to be living on their own means, or returned as pensioned, or retired from definite occupation. Thus the enumerated population is shown in the tables as either occupied or unoccupied—that is, as following or not following some definite occupation, whether in or out of work at the time of the census. The article referred to points out that between 1881 and 1901 the number of persons returned in the census schedules as not following any definite occupation showed a larger increase than did the number of those persons who were returned as following definite occupation, and it was argued therefrom that the productive force of the nation is declining. As the census figures upon which this conclusion is based relate to the entire population of men, women, and children aged upwards of ten years, in order to estimate the true import of this increase in the proportion of the unoccupied it is necessary to examine the facts for males

and females separately. The result of such examination is to show that the increase of unoccupied males aged upwards of ten years between 1881 and 1901 did not exceed 27 per cent., whereas the increase of males at those ages returned as following definite occupations was equal to 31 per cent. Among females at those ages, on the other hand, the number returned as unoccupied showed an increase of 37 per cent., while the increase among those returned as following some definite occupation did not exceed 23 per cent. The number and proportion of males engaged in definite occupations thus showed an increase during the 20 years referred to, whereas the number and proportion of females so engaged had declined. The decline in the proportion of females following definite occupations was one of the most surprising features of the report on the last census in 1901. The marked increase between 1881 and 1901 in the proportion of women engaged in professional and commercial occupations was far more than counterbalanced by the marked decline in the larger number of women engaged in domestic indoor service, in agricultural occupations, and in textile manufacture. This is not the place to discuss the economic result of this apparent decline in the definite employment of women of the working-classes apart from their household and family duties, but should this decline be mainly due, as seems to be very probable, to the improved condition of the weekly-wage class, rendering it decreasingly necessary for women to follow definite occupations after marriage, the changes noted may be viewed with satisfaction. Any decline in the proportional employment of married women in definite occupation or handicraft should clearly promote the cause of public health and tend to reduce the present excessive rate of infant mortality. According to the report on the census in 1901 52·3 per cent. of unmarried females in England and Wales, aged upwards of ten years, were engaged in definite occupation, while of the married or widowed women no less than 13·2 per cent. were so engaged; and in Blackburn, for example, 37·9 per cent. of the married or widowed women were definitely employed. No similar information was published in previous census reports, and we must wait for the report on the next census for further explanation of the evidence of the decline in the proportion of women following definite occupations, derived from published census statistics.

THE SOCIETY OF JESUS AND THE HEALING ART.

AN Italian correspondent, writing under date Sept. 8th, says: "The event of the week, ecclesiastical and political, has been the election of the 'Black Pope,' as the General of the Jesuits is familiarly called, and the occasion may be utilised to remind us of what may be set down to the credit of a society not too favourably regarded by the non-Catholic world—namely, its services to the sciences in general and to the healing art in particular. Founded by Loyola to counterpoise, and if possible to defeat, the Reformation promoted by Luther, it pressed into its service every weapon that could reinforce it in the conflict, and, strange as it may seem in an organisation accused of 'obscurantism,' it enrolled the man of science and the medically trained missionary under its banner, inscribed 'Ad Majorem Dei Gloriam.' In nature-study, as well as in mathematics pure and applied, the Jesuit in the early post-Renaissance period made his mark in nearly every department, and the missionaries of the society, mainly Portuguese, in furtherance of its poet-laureate's ideal—

> 'Loyola Lutheri triumphos
> Orbe Novo reparabit ultor'—

over-ran the new world and the unexplored regions of the old, making converts to the Church and enriching the scientific knowledge already theirs by concurrent observation and research. What visitor to the Vatican has failed to be struck, in the Gallery of the Geographical Maps, with the sagacity of the missionaries who framed them—the watershed of sub-equatorial Africa, for example, being given, hypothetically indeed, but with an approximate accuracy which it was reserved for the latter half of the nineteenth century to complete and to ratify? Again, what student of the medical past has forgotten the beautiful story of the discovery of the quinine-bearing cinchona and the introduction into the physician's armoury of 'Jesuits' Bark,' first exhibited in the seventeenth century, and since then, by pharmaceutical refinements, developed into the salt which is to the European sojourner in the tropics what the Davy lamp is to the miner? Finely told in Sir Thomas Watson's 'Practice of Physic'—a 'professional classic,' if only for the scholarly finish of its language and the artistic cadence of its periods—the story redounds to the credit of the Society but for whose emissary the discovery might have had to wait, who knows how long! Even in the modern day the Jesuit remains true to his scientific traditions—witness those worthy descendants of the Père Boscovich, the Padre Secchi, famed for his 'Solar Physics,' and his successor in the directorate of the Vatican Observatory, the Padre Denza. The latter, indeed, besides his work in seismology perpetuated on identical lines by members of the Society throughout Italy, will always be remembered for his demonstration of the origin of that scourge of the Mediterranean seaboard, the wind known as the 'scirocco.' Having surmised that the said wind was always coincident with a sand-storm in the Sahara, he stationed a correspondent at the border-land between the Tell, as cultivated Algeria is called, and the great desert, with instructions to telegraph to him on the Italian littoral whenever a sand-storm was brewing. 'Detto fatto'—the correspondent acted accordingly. On came the wind, the Padre Denza being duly prepared for its advent, at various points of the Italian shore, with huge façades of cardboard wet with gum. And sure enough, as it passed oversea inland a thick layer of sand was deposited on the said 'façades,' thus explaining what had been observed, but not traced to its cause, by Celsus—namely, the sense of heat, of weight, of general depression, and lowered vitality experienced during the prevalence of the scirocco—an experience not to be escaped till, by reclamation and crop-culture, the Sahara ceases to be the 'sand ocean' it has been from time immemorial. Inspired by the traditional genius of the Society, the Padre Massaia in his thrilling record of mission work thirty—nay, forty—years ago in the Galla country (west of Abyssinia), ascribes to his nature-study and his command of the healing art the success of the enterprise which brought him the gratitude of the Pope and the title of Cardinal. Setting out as a simple monk about the middle of last century long before the opening up of Egypt to civilisation and the present facilities for travel, he reached the scene of his labours with only the Bible and the crozier of St. Francis. First he began to make friends with the savage natives by teaching them the 'arts of peace' and of civilised life—down to tenement structure, cooking, and clothing. All this time he was quietly mastering their language, till he constructed its grammar for them, and finally translated into it portions of Holy Writ. Then he set up a printing press (thanks to subsidies from the Propaganda) and taught the younger of the natives to read. Still his progress—well-nigh single-handed—was slow, till the periodical outbreaks of small-pox gave him his opportunity. He vaccinated as many of the natives as he could prevail upon to submit to the operation and when the tribe at the next epidemic of the disease found his patients 'immune,' while those who had held back from becoming so either died or emerged from it disfigured, their liking for him deepened into love and a superstitious belief in his power. The success of his mission was then assured. Yes, the poet-laureate of the society was

warranted in typifying the mission march of Loyola as that of a well-meaning, beneficent giant:—

'Tellus gigantis sentit iter; simul
Idola nutant; fana ruunt; micat
Christi triumphantis tropaeum,
Cruxque novos numerat clientes.

Videre gentes Xaverii jubar
Igni coruscо nubila dividens,
Cupitque mirans Christianos
Per medios fluitare Ganges.'

But it was in the degree in which they reinforced religion with science, above all with the healing art in its widest sense, clinical and hygienic, that the Jesuit apostles effected their most salutary work—a work which made them the progenitors, so to speak, of Livingstone and Bishop Pattison and Dr. Stewart of Lovedale—a work which, if pursued in the spirit of these pioneers, will go far to conciliate for the Society an admiration and a sympathy hitherto withheld from it even among Catholics themselves."

POISONING BY BROMOFORM.

A NUMBER of fatal cases of poisoning by bromoform have been recorded in a recent number of *La Semaine Médicale*. In 1890, shortly after the introduction of the drug into medicine, M. Nonwelaers of Brussels described the case of a child, 15 months old, who died 14 hours after the administration of a mixture which was ordered to be given daily in doses corresponding to 12 drops of bromoform, but this dose was exceeded. In 1902 Dr. Krioull of Wenden reported the case of a girl, aged three years, who died after the daily administration of several dessert-spoonful doses of a 12 per cent. mixture which had been prescribed previously for a child 11 years old. In 1904 Dr. Roth of Brunswick witnessed the death of a child, five years old, from taking a dose of a mixture corresponding to five grammes of bromoform. The child died in coma in spite of medical attention. Quite recently a similar case came to the notice of Dr. Haakma Tresling of Winschoten. A child was told to empty a bottle containing a bromoform mixture which had been prescribed for another member of the family. Instead of obeying he administered it in play to a younger brother, aged four years, with serious results. The child was seized with dizziness, followed by collapse, stertorous breathing, and relaxation of the muscles. It was not found possible to make him vomit, and eventually he succumbed. In this case a dose of from four to five grammes of bromoform proved fatal. As bromoform is so largely used in the treatment of whooping-cough the danger of administering excessive doses should be recognised.

WORKHOUSES AND THE TEMPORARY CARE OF INSANE PERSONS.

A SAD case of suicide recently took place at Chard, the facts of which we take from a full report contained in the *Chard and Ilminster News* of Sept. 1st. Briefly they are as follows. Mr. Napier Close of Chard was visited at his surgery late one afternoon by a young woman in an excited condition who asked him to take care of her. He formed the opinion that she was insane and having sent for the relieving officer, who was not at home, obtained the assistance of a police sergeant, who conveyed her to the workhouse, taking with him the following written message to the master from Mr. Close: "Mary Jane Hayball is suffering from melancholia and has threatened to do away with herself. Please admit her to the workhouse until the return of Mr. Hawker [the relieving officer] who will take over the case." At the workhouse the master refused to accept responsibility and was unwilling to take the patient in, protesting that the workhouse was not a fit and proper place for her, but afterwards he allowed her to be placed in the reception room and Mr. Close himself obtained the services of a woman living in the neighbourhood to take charge of her temporarily. The relieving officer returned to the workhouse about half-past ten at night, took no steps to have the patient removed, and left her in charge of the attendant mentioned. Shortly afterwards she became violent, overcame the resistance of the woman in charge of her, whose cries for assistance were either unheard or disregarded, and escaped through a window, committing suicide by drowning herself before she could be recaptured. The conduct of those in immediate charge of the workhouse and their responsibility in the matter do not appear to have been very closely inquired into by the coroner, who seems to have told the jury that they were not concerned with such questions. The attitude of the Chard guardians, however, seems to be shown fairly clearly by a speech which their chairman made at the inquest before the proceedings began. This gentleman, according to the report referred to, "expressed to the coroner his own regret and the regret of the board on the unfortunate occurrence which had occasioned his (the coroner's) presence that afternoon. He held, and the board of guardians held, that it was not the fault of any of the officers within the walls. They, however, thought that greater care should be exercised by medical officers in admitting cases of that sort to the workhouse. The workhouse was not a lunatic asylum, it was a place for the relief of the poor and others who were from time to time glad to seek refuge there. The workhouse was not a place for people who were *non compos mentis*. He begged to express their deep regret and inform the coroner that they would be very careful to see that in future no persons who were suffering as this poor unfortunate woman suffered would be admitted within the walls." This address seems to be in accord with the views of the board which held a meeting shortly before the inquest took place. We would point out to the Chard board of guardians, however, that while a workhouse is not a lunatic asylum, and possibly the Chard workhouse may be ill fitted for an emergency such as that which occurred, the temporary charge of a person who has suddenly become insane is not by any means an unusual thing to be undertaken at a workhouse, and constitutes a form of relief of the poor which sometimes is greatly and urgently needed. Perusal, moreover, of some of the sections of the Lunacy Acts, 1890 and 1891, should satisfy the Chard board of guardians that the legislature has done its best to provide that temporary safety should be obtainable for the afflicted person in a workhouse until the somewhat complicated machinery provided for his necessary protection can be set in motion. In particular, Section 20 of the Lunacy Act, 1890, orders that "if a constable, relieving officer, or overseer is satisfied that it is necessary for the public safety or the welfare of an alleged lunatic, with regard to whom it is his duty to take any proceedings under this Act, that the alleged lunatic should, before any such proceedings can be taken, be placed under care and control, the constable, relieving officer, or overseer may remove the alleged lunatic to the workhouse of the union in which the alleged lunatic is, and the master of the workhouse shall, unless there is no proper accommodation in the workhouse for the alleged lunatic, receive and relieve and detain the alleged lunatic therein; but no person shall be so detained for more than three days, and before the expiration of that time the constable, relieving officer, or overseer shall take such proceedings with regard to the alleged lunatic as are required by the Act." The question of the control of lunatics, whether paupers or not, with regard to whom it is evidently of urgent importance that they should be placed under care and control, has been considered in framing the Lunacy Acts, with a view to preventing precisely such occurrences as took place at Chard;

and if it be urged by the Chard guardians that they have no proper accommodation to meet emergencies which at any time may arise, and which may end in the needless sacrifice of human life, the answer may be that the introduction of such accommodation would render their workhouse a more useful institution for the relief of the poor of the union. Three persons seem to have done their best to meet the requirements of the case above recorded and it is a matter of regret that success was denied to their efforts: Mr. Napier Close, who certainly did his utmost in unusually difficult circumstances on behalf of his patient, Police-Sergeant Attwood, and Mrs. Templeman, who was placed in charge of the insane person, and who, according to her account, struggled with her unaided for an hour before she broke away.

THE SUMMER: JUNE, JULY, AND AUGUST.

FOR the purposes of meteorological statistics the three months from June to August are generally taken as comprising the summer in this country, but the heat did not reach its culminating point this year until the 31st of last month or a day or two later. The chief characteristics of the three months here discussed were not their warmth, which was not at all exceptional, but their great and consistent dryness at nearly all places situated towards the south and south-east and in the midlands, and also the large number of hours of sunshine recorded. Of all the places having a sufficiently trustworthy average only two—Scilly and Nottingham—show a deficit, although the excess was only very slight at Aberdeen. Among the localities given in the table the spots with the greatest aggregate number of hours were Jersey, Clacton-on-Sea, Bournemouth, Torquay, Folkestone, Shanklin, and Lowestoft. The greatest excess over the normal, however, was in London (Westminster), where the total sunshine of 693 hours equalled seven and a half hours daily. The large excess of 177 hours for the three months is equal to nearly two hours per day more than the average of the records of the past 25 years warrants. The dullest spots were Glasgow and Manchester, the aggregate hours of sunshine only representing a mean daily duration of a trifle more than five hours at the former city and less than five and a half hours at the latter. The relatively small amount of sunshine at Aberystwyth was due rather to sea fogs and mists than to cloud, and the same unwelcome phenomena also robbed Brighton and a few other resorts on the south coast of several sunny days. The days on which rain fell were about twice as numerous in the north and north-west as in the south and south-east, while in the south-west Torquay especially was noted for its very few rainy days. But everywhere the total fall of rain for the three months was less than the normal. August was, however, rather wetter than usual at many places in the north and north-west. At Clacton-on-Sea rain was only experienced on 20 days and at Lowestoft on 21, against 44 at Blackpool, Harrogate, and Aberdeen, 50 at Glasgow, and 58 at Manchester. A notable example of the effect of local thunderstorms is afforded by the total rainfall at Lowestoft and Great Yarmouth. The Suffolk resort had an aggregate of only 2·44 inches, while at the Norfolk resort, only about nine miles further north, the total yield of the gauge was as much as 5·90 inches. In regard to temperature the summer was remarkable both for the few unseasonably cold spells and for the few extremely hot ones. As a general rule the thermometer was slightly above the average both during the day and night. This is fully supported by the difference from the normal, which, except in a place here and there, showed a slight excess of warmth. The only places with a mean daily maximum of 70° or above were London (72°), Nottingham, Bath, and Bournemouth, and the only spots with a mean minimum as low as 50° were Aberdeen and Harrogate. The warmest nights and most equable temperature were, as usual, experienced in the Scilly Isles, while the places with the greatest diurnal range of temperature were Nottingham, Bath, and London. It is probably only a curious coincidence that the mean temperature at two such dissimilar places as Jersey and Margate was identical. The absolutely highest temperatures registered within the three months all occurred on August 31st. The highest was 93° at Nottingham, followed closely by 91° in London (St. James's Park) and at Margate, 89° at Birmingham and Manchester, and 88° at Bath. During the summer as a whole maxima as high as 80° were very rare and only occurred in the southern, eastern, and inland districts.

—	Temperature (degrees).				Rainfall (inches).			Sunshine (hours).	
	Mean maximum.	Mean minimum.	Mean temperature.	Difference from average.	Days with rain.*	Total fall.	Difference from average.	Number of hours of sunshine.	Difference from average.
Blackpool	65	52	58·4	−0·3	44	6·28	−2·39	680	+150
Llandudno...	63	54	58·6	+0·7	37	5·88	−1·48	671	+119
Aberystwyth	63	54	58·6	—	—	—	—	545	?
Scilly	64	57	60·1	+0·3	37	4·62	−2·26	654	−38
Jersey	69	55	62·2	+0·5	27	1·88	−5·04	787	+52
Plymouth	66	54	60·2	−0·3	38	5·83	−1·25	671	+53
Torquay	67	55	60·9	+0·3	28	4·65	−2·64	760	+102
Shanklin	—	—	—	—	—	3·32	?	752	?
Bournemouth	70	53	61·1	?	28	3·23	?	771	?
Brighton	67	54	60·8	−0·3	23	3·85	−2·62	735	+60
Folkestone	67	52	59·7	?	22	2·80	?	759	?
Margate	69	55	62·2	+0·8	25	2·10	−2·37	728	+146
Clacton	68	54	60·9	−0·2	20	3·12	?	778	?
Lowestoft	66	53	59·6	+0·3	21	2·44	−4·13	751	?
Yarmouth	66	55	60·3	+1·0	27	5·90	−1·08	?	?
Scarborough	66	53	59·2	+1·2	33	4·01	−2·99	583	?
Aberdeen	63	50	56·2	+0·4	44	5·86	−1·97	512	+9
Harrogate	67	50	58·7	+1·1	44	6·56	−1·37	578	?
Bath	70	52	60·9	−0·2	27	5·51	−2·35	710	+114
Glasgow	64	51	57·6	+0·9	50	8·58	−1·59	474	+37
Manchester	69	53	60·7	+1·6	58	6·58	?	497	?
Nottingham	71	51	61·2	+1·0	28	3·24	−4·14	617	−7
Birmingham	69	52	60·3	+1·3	34	4·70	−3·14	535	?
London	72	54	62·8	+0·6	24	4·20	−2·78	693	+177

* A day with rain is one on which at least 0·01 inch has fallen.

THE TOXIC ACTION AND LOCALISATION OF RADIUM EMANATIONS.

M. Ch. Bouchard and M. V. Balthazard have extended a research, which was first conducted in collaboration with the late Professor Curie, on the toxic action on animals of the emanations from radium, and have determined to what extent the different tissues and organs are affected.[1] They have previously shown that radium emanations are toxic to mice and guinea-pigs when administered by the respiratory tract. By a modification of the method formerly employed they now demonstrate that the emanations are toxic to guinea-pigs when radio-active sulphate of barium is introduced into the peritoneum. Two grammes of the salt, having an activity of 5000 and containing about five to six milligrammes of sulphate of radium, were inserted in a sac of collodion and introduced into the peritoneal cavity under aseptic conditions after laparotomy. Guinea-pigs treated in this manner succumbed on the tenth to the fifteenth day. It was found that the emanations are localised chiefly in the suprarenal capsules, one gramme of which contains as much

[1] Comptes Rendus, July 23rd, 1906, p. 198.

of the emanations as 4·7 grammes of spleen, 11·4 grammes of lung, 15 grammes of skin, 60 grammes of liver, and 100 grammes of kidney.

FOREIGN BODY IN THE ORBIT FOR NEARLY FOUR YEARS.

IN the *Australasian Medical Gazette* for June Mr. F. A. Pockley has reported the following remarkable case. On May 21st, 1902, a boy, aged nine years, was brought to him for advice. Eight days before, while playing, the boy was knocked against a paling and fell with another boy on top of him. He immediately pulled a splinter of wood out of his right eye and there was slight bleeding. He was stunned by the fall and for two days had headache and occasional retching. When he recovered from the concussion, which was only momentary, he had no perception of light in the right eye and the eyeball was somewhat protruded. On examination the right eye was found proptosed. An inch below the eye and slightly to the nasal side was a small cicatrix. The lower part of the orbit was tender. There was an offensive smell from the eye. The ophthalmoscope showed great swelling and tortuosity of the veins near the disc. Under chloroform an incision was made through the conjunctiva midway between the inferior oblique and the inferior rectus muscles and a splinter of hard wood three-quarters of an inch long and three-sixteenths of an inch thick was removed. Careful probing revealed no other foreign body but the wound was syringed out and left open and a gauze drain was left in for a few days. By May 29th the eye had receded to its normal position and there was no pain or tenderness on pressing it backwards into the orbit. The optic neuritis became much more marked and atrophy of the nerve followed. In February, 1906, the boy was again seen. His mother brought a piece of wood, one and a quarter inches long and one-eighth of an inch thick, which he "had found sticking out of the corner of his eye" on Jan. 31st on waking in the morning. There had been no pain or swelling previously and nothing had been noticed when he went to bed the night before. On the second splinter were dentations which exactly fitted into ones on the first. Cases of foreign bodies being lodged in the orbit for some time without the patient being aware of it are not very rare, but the period is generally much shorter than in the present case, which amounted to nearly four years. In Mr. Brudenell Carter's well-known case a portion of a metal hat-peg, three and a quarter inches long, remained in the orbit two or three weeks without the patient being aware of it. Mr. H. R. Swanzy has recorded a case in which a piece of wood, three quarters of an inch long and half an inch wide, remained undetected in the orbit for many weeks.

THE OUTBREAK OF DIPHTHERIA AT THE LAMBETH PAROCHIAL SCHOOLS.

WE have received a pamphlet with the title, "History of a Diphtheria Outbreak at the Lambeth Parochial Schools, West Norwood, May to July, 1905," by Dr. Joseph Priestley, medical officer of health of the metropolitan borough of Lambeth. The report is a most interesting one and contains many observations well worthy of note. An outbreak of diphtheria occurred during May, June, and July, 1905, amongst the children at the Lambeth Parochial Schools, situated in Elder-road, West Norwood. The majority of the cases were of a mild (chiefly nasal) type, which naturally gave rise to difficulties not only in diagnosis but also in the adoption of the usual preventive measures. The slightness, and in some cases the apparent absence, of the well-known clinical symptoms of diphtheria rendered it necessary to carry out minute and careful bacteriological examinations both of "suspects" and of "contacts." These investigations were all carried out in the borough laboratory and reflect great credit on the workers in that institution. Of special interest was the presence in the throats and noses of some of the patients of a mixed infection—viz., (*a*) Vincent's organisms, in addition to (*b*) Hoffmann's pseudo diphtheria bacilli; and (*c*) Klebs-Löffler diphtheria bacilli. By means of the presence in some of the cases of these Vincent's organisms the source of the outbreak was definitely traced. We may remind our readers that Vincent's organisms consist (1) of fusiform elongated bacilli varying in length from 6 to 12 μ and from 1 to 1·5 μ in breadth, vacuolated, motile or non-motile, not staining with Gram's fluid but staining irregularly with Ziehl's liquid; and (2) fine long spirilla of varying lengths, sinuous and very motile, staining badly (or not at all) with the usual staining fluids. By permission of Professor H. Vincent a good illustration of these organisms has been inserted in the report. The presence of Vincent's organisms was due to a concurrent attack or outbreak of either ulcerative stomatitis or the ulcerative form of Vincent's angina, which occurred at (and about) the time of the diphtheria outbreak. In THE LANCET of July 16th, 1904, p. 135, we published a paper by Dr. H. W. Bruce on this affection, who pointed out that the disease was of importance because it was very likely to be mistaken for diphtheria. In THE LANCET of May 13th, 1905, p. 1260, will be found an article upon Vincent's angina from the pen of Professor Vincent himself. From this description it will be seen that it is a disease allied to diphtheria and other forms of throat troubles and appears at times to be contagious, spreading from person to person, either by direct contact or indirectly through the use of towels, drinking utensils, and so on. The disease exists in two forms: (1) diphtheroid (like diphtheria) or (2) ulcero-membranous (deep ulcerations of the membranes over the tonsils and palate). It may appear at any age but is especially frequent amongst children from eight to ten years and amongst young adults from 18 to 30 years of age. Its occurrence at the time of the outbreak of diphtheria at the Lambeth schools is of great interest and demonstrates the value of careful bacteriological examinations. Dr. Priestley gives a good account of the details of the outbreak of diphtheria and of the means which were taken to check its spread. Many patients were found who appeared to have no clinical symptoms of diphtheria but in whose throats or noses (or both) the pathogenic bacillus was found. These individuals were capable of conveying the disease to others, but there was a timidity in removing them to the Metropolitan Asylums Board hospitals. Dr. Priestley mentions that the difficulties were added to by the doubt in the minds of some of the guardians as to the value of the bacteriological examinations. We trust that by now they have been fully convinced and that their doubts have vanished. We congratulate Dr. Priestley on the completeness of his report.

BRONCHO-PNEUMONIA DUE TO THE BACILLUS OF FRIEDLÄNDER.

THE bacillus of Friedländer is one of the organisms which produce pneumomia, but since Fraenkel's discovery that the pneumococcus is the usual cause of pneumonia the former organism has received little attention from clinicians or pathologists. In the *Archives Générales de Médecine* of July 10th M. Lucien Rivet has reported the following interesting case. A man, aged 63 years, was admitted into hospital under the care of Dr. Chauffard on June 5th, 1905. He had been suddenly taken ill on June 1st with acute pain below the right breast, which was followed by a severe and prolonged rigor. At the same time there appeared a dry and "tearing" cough and high fever.

From the beginning there was bloody expectoration. On admission intense dyspnœa was present, the face was cyanosed, the respirations were 40 and shallow, the skin generally was bluish, and the eyes were bright and injected. The upper half of the right chest was absolutely dull, the vocal fremitus was abolished, and there was tubular breathing. In the axilla crepitant rales were heard. In the rest of the chest there were scattered sibilant rales. The sputum was very viscid and adherent and definitely bloody. The pulse was 130 and good. The urine was scanty and contained a little albumin. The temperature was 103·6° F. The sputum contained the pneumo-bacillus of Friedländer in pure culture. The bacillus was strongly coloured by methylene blue and did not retain Gram's stain. On the 7th the temperature was 103·1°, the pulse became thready and uncountable, and the patient died. The necropsy showed hepatisation of the upper lobe of the right lung, which was of a violaceous red colour, finely granular appearance, and friable. The middle lobe was in a state of atelectasis and the lower lobe appeared normal. In the upper lobe of the left lung there was one focus of hepatisation and in the lower lobe four foci. These foci were of the same appearance as the hepatised mass on the right side but much smaller, varying from the size of a walnut to that of a mandarin orange. The heart was fatty and there were some small calcareous patches on the aorta. The kidneys were much congested. The hepatised lung and spleen contained the bacillus of Friedländer in pure culture. Sections of the hepatised lung, both of the large mass in the right lung and the smaller foci in the left, showed the characteristic changes of pneumonia—fibrinous exudation containing desquamated epithelium and numerous leucocytes, particularly polynuclear ones. In places the blood-vessels were much dilated, forming veritable lakes of blood. In all the lesions were numerous bacilli of Friedländer. The liver was very fatty and slightly cirrhotic and showed some nodules containing the pneumo-bacillus. The cortex of the kidneys contained the bacillus both in an isolated form and in little colonies. The spleen also contained colonies and hæmorrhagic foci. M. Netter has pointed out the importance of the pneumo-bacillus in the production of broncho-pneumonia. Some writers insist on the extreme gravity of pneumonia and broncho-pneumonia when this organism is present. According to M. Netter the sputum is still more viscid than in ordinary pneumonia and in four out of five of his cases it was rusty, being greyish in the remaining one. In the present case it was more than rusty—it was distinctly hæmorrhagic. The pneumo-bacillus seems prone to produce hæmorrhagic lesions. Fatal cases of hæmorrhagic septicæmia due to it have been recorded and this disease has been produced in the rabbit by inoculation. It is noteworthy that the gravity of the case described above was not due merely to the pulmonary lesions but that there was a general infection with the pneumo-bacillus. Such a general infection is now well known to occur in the ordinary pneumonia due to the pneumococcus.

THE STERILISATION OF CATGUT BY MEANS OF BENZINE.

Dr. Kendirdjy has recorded in the *Répertoire de Pharmacie* of July 10th the results of an investigation of the various methods employed for the sterilisation of catgut, and he confirms the work of M. Beslier,[1] who found the vapour of benzine to give more satisfactory results than alcohol or acetone. Dr. Kendirdjy states, however, that one sterilisation is not sufficient, as he has obtained cultures of the bacillus subtilis from catgut which had been once sterilised with benzine. He thinks that the process should be repeated five times. His modification of the method consists in heating the catgut in the vapour of crystallisable benzine at a temperature of from 120° to 130° C. for one hour on five successive days. The vapour of benzine does not affect the solidity or the suppleness of the catgut and, when applied as directed, completely destroys the spores of the bacillus subtilis and all other micro organisms.

[1] See THE LANCET, Sept. 16th, 1905, p. 844.

Professor Ivan Petrovitsch Pawlow, professor of physiology in the University of St. Petersburg, will open the winter session of the medical school at Charing Cross Hospital on Monday, Oct. 1st, and deliver the sixth biennial Huxley lecture "On Recent Advances in Science and their Bearing on Medicine and Surgery," at 4 P.M. Medical practitioners desiring to attend can obtain cards of admission on application to the Dean so far as the accommodation goes.

WE are informed that Dr. Frederick Taylor, the senior physician to Guy's Hospital, and Dr. E. G. Graham Little, physician for diseases of the skin at St. Mary's Hospital, are standing as candidates for the vacancy which has arisen, owing to the resignation of Dr. J. F. Payne, among the members of the Senate of the University of London representing convocation.

THE death of Dr. J. H. Bell of Bradford is announced at the age of 74 years. Dr. Bell was well known in the medical profession for his studies in the subject of anthrax. We hope to give an extended account of his career in a future issue.

THE session at St. Thomas's Hospital will commence on Oct. 3rd, and the Old Students' dinner will be held at the Hotel Cecil on the previous evening at 7 for 7.30 P.M., when Dr. Arthur Newsholme will preside.

A TELEGRAM from the Acting Governor of the Mauritius received at the Colonial Office on Sept. 7th states that during the fortnight ended on Sept. 6th there were 13 cases of plague, all of which proved fatal.

MEAT INSPECTION IN BELFAST.

THE honorary secretary of the Belfast Provision Curers' Association has issued and sent to the members of the Belfast corporation an important document on the question of meat inspection, especially in reference to pork. He points out that he knows of no evidence based on statistics taken in Ireland which would support the theory put forward by the 1898 Royal Commission on Tuberculosis (Sir Herbert Maxwell's Commission), in which it is stated that "in view of the greater tendency to generalisation of tuberculosis in the pig, we consider that the presence of tubercular deposit in any degree should involve seizure of the whole carcass and the organs." This has not been verified by actual inspection of swine in the North of Ireland, and the experience of the local provision trade is entirely against it. It is noteworthy that while pig-raising is a most important industry in Ireland, yet when it comes to the selection of a Royal Commission to devise practical measures for the control of tuberculosis in the meat-supply not a single representative from Ireland is appointed, nor, indeed, anyone with any practical acquaintance with the provision curing trade. It is a pity that this was so, as the omission has evidently left a feeling of soreness. The report of the secretary of the Belfast Provision Curers' Association goes on to point out that it is very remarkable that the Royal Commission made a distinction between tuberculous pigs and tuberculous cattle, recommending that in the case of cattle the carcass, if otherwise healthy, should not be "condemned" but only such part of it as contained tuberculous lesions, and only in case of advanced tuberculosis was the entire carcass of cattle to be destroyed. This distinction, the association affirms, is not recognised in the practice of other countries, pigs and cattle being treated alike.

The report urges that much has been learned with regard to tuberculosis since 1898, the date of Sir Herbert Maxwell's Commission. A Committee of the House of Commons took evidence in connexion with the Tuberculosis (Animals) Compensation Bill (1904), and of all the witnesses who gave evidence in 1904 not one supported the recommendations of the Maxwell Commission as regards pigs. Professor Matthew Hay of Aberdeen stated that only two pigs out of 2000 slaughtered in the previous year in that city were condemned. It is obvious that Aberdeen, in the case of the pig, does not follow the recommendation of the Royal Commission. Before the same Committee Dr. R S. Marsden of Birkenhead, in reply to the question "Do you as a scientific man say that an animal with even the smallest amount of tubercle can be fit for human food or as fit as an animal that has not tuberculosis at all?" answered: "Yes, I think so. I think to some extent there was exaggeration in the minds of some of us when we originally began. I think if the dangers were as great as at first supposed there would have been far greater evils than have occurred. Therefore, I do not think it right to condemn on the merest speck of tubercle a whole carcass. I think it a matter in which a man must use common sense as well as scientific knowledge, and I lay great stress on common sense." Mr. J. King, veterinary inspector for the Corporation of London, stated "as his own personal view, with his experience of many years, that Sir Herbert Maxwell's Commission was too hard upon the pig." "Pigs," he added, "ought to be dealt with in the same way as cattle—that is to say, that tuberculosis should be treated as a localised disease." The superintendent of the Birmingham corporation markets (Mr. F. H. Edwards) stated that in Birmingham out of 175,000 pigs slaughtered the number of condemnations was 291. The Birmingham authorities did not follow, he said, the recommendations of the Royal Commission (Sir Herbert Maxwell's) in the case of pigs. "We do not," he said, "condemn the whole carcass where it is a mere local affection with regard to pigs." The chairman of the health committee of the corporation of Glasgow, Bailie Anderson, J.P., submitted statistics to show that during 1905 53,483 swine were slaughtered in Glasgow. Of these 2132 were found to be affected with tuberculosis, 152 were subsequently passed, 75 were totally destroyed, while 1905 pigs were partially destroyed (heads only), the remainder of the carcass being handed back to the owner. Under the Belfast system of inspection, where there is no classification as to the degree of tuberculosis, instead of 75 pigs being totally destroyed, as in Glasgow, there would have been 2132. Bailie Anderson informed the committee that the Glasgow inspection "was not quite so stringent as the Commission on Tuberculosis recommended in the case of pigs." All this evidence, which has accumulated since Sir Herbert Maxwell's Commission sat, ought, the Belfast Provision Curers' Association thinks, to receive proper attention.

The secretary of the association next submits an actual test carried out on four pigs bought in Cookstown market on July 7th, 1906, and condemned by the inspector of the Belfast corporation to total destruction as being unfit for food. These were carefully examined by Professor W. St. Clair Symmers of Queen's College, Belfast. Three of the animals showed tuberculous changes in certain of the neck glands and the fourth did not contain any tuberculous glands at the time he saw it. Neither by the naked eye nor microscopically could Professor Symmers detect evidence of tuberculosis in the flesh of these animals, nor in the juices obtained from the flesh by the most rigorous method known to bacteriologists. He says in his report: "I conclude that the flesh of these four animals was free from tuberculous germs, that the tubercle was limited to the neck glands, and that the destruction of the non-tuberculous portions of the carcass was unnecessary. I may add that proper cooking will easily destroy any tuberculous germs if such should happen to be present, but in the flesh (as distinct from the glands) of the four pigs here in question there were no tubercles to be destroyed."

Reference in the report is then made to the measures adopted in Germany to protect the meat-supply and Professor Ostertag, of the Veterinary High School at Berlin, is quoted as stating in his "Handbook of Meat Inspection" that "at present the view is generally entertained that in undoubted cases of local tuberculosis the meat is harmless, while in generalised cases it is harmful," and that "the assumption of the harmlessness of meat in cases of undoubted local tuberculosis will probably remain for all time as an immutable dogma of meat inspection." This is the view which the Belfast Provision Curers' Association ask, the Belfast corporation to adopt, in line with the practice of the great English cities mentioned and with Germany itself, where the most severe restrictions are in force in order to protect a population that eats uncooked meat. Professor MacFadyean is quoted as saying before the Royal Commission of 1896: "I feel quite satisfied that if tuberculosis were absolutely eradicated from the cattle of this country it could not sensibly affect the percentage of tuberculosis among human beings." And, again: "I doubt whether there are ten people in this country in the year who contract tuberculosis through meat; I think even one might doubt whether there is one." Again, Sir Charles Cameron stated before the same Royal Commissioners: "If I were put into the witness-box I would not be able to swear I ever knew anyone who got tuberculosis from either meat or milk, and there are few people who could do so." In Prussia during 1902 (latest statistics available) there were slaughtered 3,909,778 pigs; of these 103,192 were found to be tuberculous but only 4604 were condemned to total destruction. The carcases of 93,825 were allowed to be sold after removal of affected organs and tissues. Under our Belfast system the whole 103,192 carcasses would have been totally destroyed. If the farmers and pig feeders of Prussia alone had been subject to the meat inspection rules of Belfast their loss from pork destroyed, calculated at present prices, would have been £380,000 to £400,000 per annum over and above what their highly-trained inspectors actually found necessary to condemn, though taking measures to protect the food-supply of a people accustomed to eat pork in large quantities absolutely uncooked. Why in Belfast, where the population uniformly cook their ham and bacon, should precautions be used to a degree beyond anything conceived in Germany?

An extract from the regulations governing the meat inspection of the United States Department of Agriculture, dated June 30th, 1906, is published as an appendix to the pamphlet. It runs as follows:—

Tuberculosis.—All carcasses affected with tuberculosis and showing emaciation shall be condemned. All other carcasses affected with tuberculosis shall be condemned, except those in which the lesions are slight, calcified, or encapsulated, and are confined to the tissues indicated in any one of the following five paragraphs, or to a less number of such tissues and excepting also those which may under Paragraphs (6) and (7) below, be rendered into lard or tallow. 1. The cervical lymphatic glands and two groups of visceral lymphatic glands in a single body cavity, such as the cervical, bronchial, and mediastinal glands or the cervical, hepatic, and mesenteric glands. 2. The cervical lymphatic glands and one group of visceral lymphatic glands and one organ in a single body cavity, such as the cervical and bronchial glands and the lungs, or the cervical and hepatic glands and the liver. 3. Two groups of visceral lymphatic glands and one organ in a single body cavity, such as the bronchial and mediastinal glands and the lungs, or the hepatic and mesenteric glands and the liver. 4. The cervical lymphatic glands and one group of visceral lymphatic glands in each body cavity, such as the cervical, bronchial, and hepatic glands. 5. Two groups of visceral lymphatic glands in the thoracic cavity, and one group in the abdominal cavity, or one group of visceral lymphatic glands in the thoracic cavity and two groups in the abdominal cavity, such as the bronchial, mediastinal, and hepatic glands, or the bronchial, hepatic, and mesenteric glands. 6. Carcasses affected with tuberculosis in which the lesions of the disease are located, as described in any one of the preceding five paragraphs, but are slight and in a state of caseation or liquefaction necrosis, or surrounded by hyperæmic zones, and also those in which slight, calcified, or encapsulated lesions are found in more visceral organs or more groups of visceral lymphatic glands than are specified in any one of the preceding five paragraphs, may be rendered into lard or tallow, after the diseased parts are removed. The carcasses shall be cooked by steam at a temperature not lower than 220° F. for not less than four hours. 7. Carcasses in which the cervical lymphatic glands, one organ, and the serous membrane in a single body cavity, such as the cervical lymphatic glands, the lungs, and the pleura or the cervical lymphatic glands, the liver, and the peritoneum, are affected with tuberculosis may be rendered into lard or tallow, after the diseased parts are removed. The carcasses shall be cooked by steam at a temperature not lower than 220° F. for not less than four hours. 8. All condemned carcasses, parts of carcasses, or organs showing lesions of tuberculosis shall be deposited in receptacles provided for that purpose and shall either be tanked at once or be locked in the "condemned" room until such time as an employee of the department can see that they are placed in the tank. 9. All heads and other parts showing lesions of tuberculosis shall be condemned.

The secretary of the Belfast Provision Curers' Association certainly makes out a strong case for asking that the meat regulations of Belfast shall be in conformity with the requirements dictated by scientific authority and prevalent elsewhere.

ON Sept. 1st Dr. T. H. S. Pullin completed 50 years' service as medical officer of the Sidmouth district of the Honiton (Devon) union.

MEDICINE AND THE LAW.

Are Honorary Medical Officers Entitled to Fees for Giving Evidence?

Is an honorary medical officer to a public hospital who has attended upon a deceased person entitled to a fee for attending an inquest touching the death of such deceased person or for making a post-mortem examination made at the request of the coroner? The matter is regulated to a great extent by Section 22 of the Coroners Act, 1887. That section prescribes the fees that are to be paid to medical witnesses. It enacts as follows:—"A legally qualified medical practitioner who has attended at a coroner's inquest in obedience to a summons of the coroner under this Act shall be entitled to receive such remuneration as follows; that is to say, (*a*) for attending to give evidence at any inquest whereat no post-mortem examination has been made by such practitioner, one guinea; and (*b*) for making a post-mortem examination of the body of the deceased, with or without an analysis of the contents of the stomach or intestines, and for attending to give evidence thereon, two guineas. Provided that—(1) any fee or remuneration shall not be paid to a medical practitioner for the performance of a post-mortem examination instituted without the previous direction of the coroner; (2) where an inquest is held on the body of a person who has died in a county or other lunatic asylum or in a public hospital, infirmary, or other medical institution, or in a building or place belonging thereto or used for the reception of the patients thereof, whether the same be supported by endowments or by voluntary subscriptions, the medical officer whose duty it may have been to attend the deceased person as a medical officer of such institution as aforesaid shall not be entitled to such fee or remuneration." This section does not define very clearly the institutions to which it is intended to apply. It has been held by a county-court judge that the sick wards of a workhouse are within the terms of the enactment, but among other institutions such as prisons, military hospitals, public schools, training colleges, almshouses and asylums for the aged, dispensaries, cottage hospitals, and nurses' homes, doubts may well arise as to whether the medical officer is entitled to claim any fees. In the not infrequent case of an accident happening in the street and death resulting before the body reaches the public hospital to which it is being carried, the medical officer of the hospital may be summoned under Section 21, Subsection (1) as an expert to give his opinion as to the cause of death, and in such case he would be entitled to the usual fee. Section 23 enacts that "where a medical practitioner fails to obey a summons of a coroner issued in pursuance of this Act, he shall, unless he shows a good and sufficient cause for not having obeyed the same, be liable on summary conviction on the prosecution of the coroner or of any two of the jury to a fine not exceeding £5." It does not appear whether this section is intended to be in addition to, or in substitution for, the powers conferred by Section 19. It would seem that the provisions of Section 19 are wide enough to cover medical practitioners; and, if so, the trouble and inconvenience of instituting a prosecution in which the decision as to the necessity of summoning the medical practitioner would rest with the justices instead of with the coroner would practically make this section a dead-letter. Subsection 2 of Section 19 of the Coroners Act enacts that "when a person duly summoned to give evidence at an inquest does not, after being openly called three times, appear to such summons, or appearing, refuses without lawful excuse to answer a question put to him, the coroner may impose on such person a fine not exceeding 40*s*." Subsection 3: "Any power by this Act vested in a coroner of imposing a fine on a juror or witness shall be deemed to be in addition to and not in derogation of any power the coroner may possess independently of this Act for compelling any person to appear and give evidence before him on any inquest or other proceeding, or for punishing any person for contempt of court in not so appearing and giving evidence, with this qualification, that a person shall not be fined by the coroner under this Act and also be punished under the powers of a coroner independently of this Act." The coroner has power to compel the attendance of a witness by summons and in case of disobedience to issue a warrant to cause him to be apprehended and brought into court, but it does not appear that there is any means provided for executing such a warrant outside the coroner's jurisdiction. In Horner *v.* Lewis (62 J.P. 345) the appellant's claim was for 2 guineas, fees alleged to be due to him under the Coroners Act, 1887, Section 22, for making a post-mortem examination by order of the respondent, the coroner for the county. The facts were as follows. The appellant was honorary medical officer to the Wanstead Children's and General Hospital and received no remuneration for attending the patients therein by way of fees, honorarium, or otherwise. He attended on the deceased child while a patient in the hospital and by order of the respondent, the coroner, made a post-mortem examination and attended the inquest under a subpœna and gave evidence as to the condition of the child when she was taken into the hospital and as to the cause of death as ascertained by means of the post-mortem examination. He applied for the fees due to him for such attendance and making the examination, but the coroner refused to pay, alleging that by the Coroners Act, 1887, Section 22, Subsections 1 and 2, the appellant was not entitled to such fees. The action was a friendly one and was brought to obtain a decision on the question in order that if the fees were payable the coroner might obtain payment from the county council. The county-court judge decided against the appellant's claim. The appeal came before Mr. Justice Wills and Mr. Justice Kennedy, sitting as a Divisional Court. Mr. Justice Wills in the course of his judgment said: "The question here is not whether one likes or dislikes the effect of the Act of Parliament which we have to interpret. I may sympathise with medical men who are made to perform duties without receiving payment for them but that cannot affect my decision. The simple point is whether this particular case falls within the Act of Parliament. It is impossible to say that this institution is not a public hospital. I shall not attempt any definition of what is a public hospital, but I think it is easy to say whether a case is one side of the line or not. In connexion with this hospital there is a published list of governors and subscribers; there are the names of a medical staff, annual meetings are held, patients are admitted by governors' letters, and all the other elements are present which are found in any of the great London hospitals, which no one would deny are undoubtedly public. Then, it is argued that the patients of this hospital are restricted to the inhabitants of a certain area and to people who can get letters from governors, but these are circumstances which are found in many great hospitals which are undoubtedly public. The next question we have to consider is whether the appellant is 'the medical officer of such institution whose duty it was to have attended on the deceased as a medical officer of such institution.' It is said that he is not because he is not paid for any of his services and that the word 'duty' can only mean that he is legally bound to attend the patients. I think it does not mean only paid duty, but that it refers to a medical officer who is within his function in attending on a patient in the institution. The appellant figures in the published list of medical officers. It is not at all unusual to find unpaid officers in London hospitals, because gentlemen perform such services gratuitously for the sake of advantages which may accrue to them in the way of experience or otherwise. It is argued that even if the appellant was the medical officer there was no 'duty' on him to attend the deceased. It is clearly his duty, though it was true it was a duty of imperfect obligation. That duty brought him within the section, and the case therefore falls under the proviso of the Act of Parliament." Therefore, so long as this decision stands honorary medical officers who may have attended a patient in a hospital or made a post-mortem examination on the direction of the coroner, are bound to attend his court and to give their evidence without fee or reward. We are strongly of opinion, however, that the law should be altered.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In 76 of the largest English towns 8350 births and 6754 deaths were registered during the week ending Sept. 8th. The annual rate of mortality in these towns, which had been equal to 18·4 and 18·3 per 1000 in the two preceding weeks rose last week to 22·3, a considerably higher rate than had prevailed in any previous week of this year.

During the first ten weeks of the current quarter the death-rate in these towns averaged 15·3 per 1000, the rate during the same period in London being 15·0. The lowest death-rates in the 76 towns during the week were 8·4 in Hornsey, 10·8 in King's Norton, 12·8 in West Hartlepool, and 13·1 in South Shields; the rates in the other towns ranged upwards to 31·4 in Hanley, 31·5 in St. Helens, 32·0 in Merthyr Tydfil, 32·8 in Coventry, and 33·8 in Grimsby. The 6754 deaths in the 76 towns showed an increase of 198 upon the number returned in the previous week, and included no fewer than 2571 which were referred to the principal epidemic diseases, against numbers increasing from 362 to 1978 in the eight preceding weeks; of these, so many as 2342 resulted from diarrhœa, while 65 were referred to measles, 60 to whooping-cough, 42 to diphtheria, 37 to "fever" (principally enteric), 24 to scarlet fever, and one to small-pox. The deaths from these epidemic diseases were equal to an annual rate of 8·5 per 1000 in the 76 towns and to 6·4 in London. These epidemic diseases caused no death in Hornsey and the annual rate therefrom did not exceed 1·0 in Halifax and 1·4 in King's Norton; whereas it ranged upwards to 16·7 in Stockport, 17·4 in Bootle, 18·1 in Hanley, and 23·2 in Coventry. The deaths referred to diarrhœa (mainly of infants under one year), which had steadily increased in the 13 preceding weeks from 50 to 1765, further rose during the week under notice to 2342; the highest annual rates from this disease during the week were 15·0 in Bootle, 16·1 in Preston, 17·3 in Hanley, and 22·5 in Coventry. The largest proportional mortality from measles occurred in Huddersfield, Bury, Stockport, and Rotherham; from whooping cough in Swansea and Middlesbrough; and from diphtheria in Aston Manor and Smethwick. Six deaths were referred to "fever" in Hull, three in Leeds, and two each in Liverpool, Bristol, and Aston Manor. Scarlet fever caused two deaths in East Ham, Birkenhead, Salford, and Sheffield. The fatal case of small-pox occurred in Devonport. No case of small-pox was under treatment in the Metropolitan Asylums hospitals during the week, no new case having been admitted thereto since the end of June. The number of scarlet fever cases under treatment in the Metropolitan Asylums hospitals and in the London Fever Hospital, which had been 3078 and 3042 at the end of the two preceding weeks, rose again to 3087 during the week under notice; 415 new cases were admitted to these hospitals during the week, against 350, and 317 in the two preceding weeks. The deaths referred to pneumonia and other diseases of the respiratory organs in London, which had been 103 and 109 in the two previous weeks, further rose last week to 143, and exceeded by 13 the corrected average in the corresponding week of the four preceding years, 1902–05. The causes of 42, or 0·6 per cent., of the deaths registered in the 76 towns during the week were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in Manchester, Leeds, Salford, Bristol, Hull, and in 48 smaller towns; the proportion of uncertified causes showed, however, a considerable excess in Reading, Wigan, Bolton, Rochdale, and Bradford.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in eight of the principal Scotch towns, which had been 13·8 and 14·2 per 1000 in the two preceding weeks, further rose to 15·6 in the week ending Sept. 8th but was no less than 6·7 below the mean rate in the same week in the 76 English towns. The rates in the eight Scotch towns ranged from 9·0 and 12·6 in Paisley and Leith to 17·1 in Dundee and in Aberdeen and 19·2 in Greenock. The 533 deaths in the eight towns showed a further increase of 46 upon the numbers returned in the two previous weeks, and included 85 which were referred to the principal epidemic diseases, against 79 and 80 in the two preceding weeks. These 85 deaths were equal to an annual rate of 2·5 per 1000, which was no less than 6·0 below the rate from the same diseases in the 76 English towns. Of these 85 deaths, 62 resulted from diarrhœa, eight from "fever," seven from whooping-cough, four from scarlet fever, two from measles, two from diphtheria, and not one from small-pox. The deaths referred to diarrhœa in the Scotch towns, which had been 54 and 48 in the two previous weeks, rose last week to 62, and exceeded the number in any previous week of this year; they included 31 in Glasgow, 10 in Dundee, nine in Edinburgh, six in Greenock, and four in Aberdeen. Seven of the eight deaths referred to "fever" were returned in Glasgow and included three certified as cerebro-spinal meningitis. The two fatal cases of measles, three of the four of scarlet fever, as well as five of the seven deaths from whooping-cough, were also returned in Glasgow. Diphtheria caused one death both in Dundee and Aberdeen. The deaths in the eight towns referred to diseases of the respiratory organs, including pneumonia, which had been 52 and 61 in the two preceding weeks, declined again to 50 in the week under notice, and were 10 below the number returned in the corresponding week of last year. The causes of 11, or 2·1 per cent., of the deaths registered during the week were not certified; the mean proportion of uncertified deaths in the 76 English towns did not exceed 0·6 per cent.

HEALTH OF DUBLIN.

The annual death-rate in Dublin, which had steadily increased from 16·8 to 21·9 per 1000 in the five preceding weeks, further rose to 24·1 during the week ending Sept. 8th. During the first ten weeks of the current quarter the death-rate in the city averaged 19·8 per 1000, the mean death-rate during the same period being only 15·0 in London and 12·9 in Edinburgh. The 175 deaths of Dublin residents during the week under notice showed a further increase of 16 upon the numbers returned in the five preceding weeks, and included 52 which were referred to the principal epidemic diseases, against 27 and 28 in the two previous weeks; these 52 deaths were equal to an annual rate of 7·2 per 1000, the death-rate during the week from the same diseases being 6·4 in London and only 1·8 in Edinburgh. Of these 52 deaths no fewer than 49 were referred to diarrhœa (against 27 in each of the two preceding weeks), two to "fever," one to whooping-cough, and not one either to small-pox, measles, scarlet fever, or diphtheria. The deaths of infants showed a marked increase on the numbers returned in recent weeks, while those of elderly persons had declined. Nine inquest cases and five deaths from violence were registered; and 54, or 30·9 per cent., of the deaths occurred in public institutions. The causes of all but one of the deaths registered during the week were duly certified.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointments are notified:—Fleet Surgeons: G. T. Broatch to the *President*, for three months' course at West London Hospital; J. H. Beattie to the *Dryad*, for Navigation Schools; W. Bowden, D.S.O., to the *Formidable* on recommissioning; A. MacLean to the *Ganges* for *Ganges II.*; E. R. Dimsey, D.S.O., to Cape Hospital; J. H. Whelan to the *Vernon*: and G. Hewlett to the *Barfleur*. Staff Surgeon H. J. Chater to the *President*, additional, for three months' course at West London Hospital. Surgeons: F. R. Mann to the *President*, for three months' course at Middlesex Hospital; E. T. Burton to the *Victory*; A. K. Smith Shand to the *Formidable*, on recommissioning; and J. Thornhill to Royal Marines at Portsmouth.

In accordance with the provisions of Her late Majesty's Order in Council of April 1st, 1881, Surgeon M. Breton has been placed on the Retired List. Fleet Surgeon F. W. Stericker has been placed on the Retired List at his own request.

ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel Richard W. Ford, D.S.O., from the Seconded List, to be Lieutenant-Colonel (dated August 17th, 1906). Lieutenant-Colonel Reginald J. C. Cottell is seconded whilst holding the appointment of Deputy Surgeon, Royal Hospital, Chelsea (dated August 17th, 1906). Captain Thomas J. Crean, V.C., retires, receiving a gratuity (dated Sept. 8th, 1906). Lieutenant John H. Spencer is seconded under the provisions of Article 349, Royal Warrant, March 19th, 1906 (dated July 31st, 1906). Lieutenant-Colonel Richard F. O'Brien retires on retired pay (dated Sept. 12th, 1906). Lieutenant-Colonel G. G. Adams has been appointed Medical Inspector of Recruits in the Southern Command. Lieutenant-Colonel H. G. Hathaway, who was dangerously wounded at Diamond Hill, South Africa, on June 11th, 1900, has been awarded a permanent wound pension.

The medical officers at the Aldershot Army Corps

manœuvres on the South Downs are as follows:—Army Corps Staff: Principal medical officer, Surgeon-General Sir Thomas Gallwey, A.M.S.; staff officer to the principal medical officer, Lieutenant-Colonel T. W. O'H. Hamilton, C.M.G. The principal medical officers of the First, Second, and Third Divisions of the Blue Force are respectively Lieutenant-Colonel H. N. Thompson, D.S.O., Major H. I. Pocock, and Major Frederick Smith, D.S.O.

ARMY MEDICAL RESERVE OF OFFICERS.

Surgeon-Lieutenant-Colonel John H. Maclean having resigned his commission in the Volunteers, ceases to belong to the Army Medical Reserve of Officers.

VOLUNTEER CORPS.

Royal Garrison Artillery (Volunteers): 2nd Middlesex: Surgeon-Captain A. B. Lyon to be Surgeon-Major (dated August 20th, 1906). 2nd Middlesex: Surgeon-Lieutenant-Colonel (Honorary Captain in the Army) A. Thorne is granted the honorary rank of Surgeon-Colonel (dated August 27th, 1906).

Rifle: 1st Volunteer Battalion the Prince Albert's (Somersetshire Light Infantry): Surgeon-Captain J. M. Harper to be Surgeon-Major (dated August 1st, 1902).

DEATHS IN THE SERVICES.

Deputy Inspector-General of Hospitals and Fleets Richard Dormer White on August 26th at Victoria Hospital, Folkestone, aged 61 years. He graduated as M.B. at the University of Dublin in 1871 and proceeded to the degree of M.D. in 1881. He entered the navy as surgeon in April, 1873, being promoted staff surgeon in April, 1885, and fleet-surgeon in October, 1893, retiring with the honorary rank of deputy inspector-general of hospitals and fleets in August, 1902. He was fleet surgeon of the *Raleigh* and served in the Naval Brigade landed from that vessel and others at Bathurst, on the River Gambia, West Coast of Africa, in February, 1894, for the punishment of a rebellious slave-raider chief. For his services with this expedition, in which he was slightly wounded, he was mentioned in despatches, was nominated for the C.B., and received the medal with Gambia, 1904, clasp. He received the thanks of the Admiralty for services in the *Cambridge* in 1873 and the thanks of the Medical Director-General for the journal of the *Bullfrog* when serving on the West Coast of Africa in 1884–85. He also served with Lord Sackville in exploring the water-sheds of the river Pilcomayo on the borders of Bolivia and Paraguay in South America.

Brigade-Surgeon Charles Frederick Richards on August 30th at Rathturret, Warrenpoint, county Down, aged 67 years. He graduated as M.B. at the University of Dublin in 1865 and entered the army as an assistant surgeon in October, 1866, being promoted surgeon in March, 1873, and surgeon-major in January, 1879, retiring with the honorary rank of brigade-surgeon in August, 1888.

THE "SPECTATOR" EXPERIMENTAL COMPANY.

We cordially congratulate the *Spectator* on its Experimental Company and on the result it has achieved in showing that young men can be sufficiently drilled and trained in the course of six months to become efficient soldiers. Nor must it be forgotten that in point of health, physique, intelligence, and alertness of mind the men are not what they were when they first joined the company to undergo a voluntary course of military training; they are all round better. This country will always need to have a regular army of highly trained and disciplined troops, and a perfect soldier cannot be turned out with the accumulated experience of a veteran in the course of six months; but the elements of military training can be acquired in the brief time named, and once acquired will not be forgotten. It now remains to be ascertained what is the minimum of periodical training practically required to maintain what has been gained.

SOLDIERS' FOUL WATER-BOTTLES.

It is notified in the Northern Command that water-bottles in such a state as to be liable to cause sickness have been found in possession of regulars, militia, yeomanry, and volunteers. Commanding officers are ordered to have all water-bottles thoroughly cleansed by scalding with boiling water, also all water carts and bottles in the Army Ordinance Department charge are to be disinfected.

Lord Kitchener has instituted a system of lectures on sanitation, to be delivered during the cold season in every military station in India by specially selected medical officers.

Correspondence.

"Audi alteram partem."

OPERATIVE TREATMENT IN CERTAIN CASES OF INSANITY.

To the Editors of THE LANCET.

SIRS,—Your correspondent, "M.R.C.S.," does well to raise the question of operative interference in one of his cases which apparently has resisted other means of treatment. I have for some years maintained the advantage of early surgical interference to relieve pressure and the necessary consequence of it—viz., wasting of the cells and disturbance of the circulation. I have also recorded cases where relief has followed operation and I have indicated in papers read before the Medico-Psychological Society, the forms of central disease in which surgical measures are to be recommended. My experience has been limited to the removal of bone but I can well understand that direct diminution of the blood-supply by ligature of a vessel is worthy of consideration. The risk of tying the carotid artery is that the sudden arrest of such a large supply of blood to one side of the brain may cause paralysis from softening and that if the patient is troublesome the after-treatment might be attended with difficulties. I have in some cases employed venesection with advantage and though the patients have occasionally tried to interfere with the bandages the difficulty has been overcome by constant supervision until the wound healed, but the possibility of difficulty in this direction should be carefully estimated before interfering with such a large vessel as the carotid artery. So much depends upon the acuteness of the symptoms that it is not necessary to do more than call attention to what may prove to be a dangerous element in considering the propriety of operation.

In the hands of a capable surgeon the operation of trephining to relieve pressure and cerebral congestion is a safe one and in my experience unattended with dangerous or troublesome consequences, and in addition it gives an opportunity of seeing the actual condition of the brain tissue and the membranes, so that an opinion on the prognosis of the case is rendered more reliable, while if desired a drainage of fluid from the congested area can be maintained before the wound is actually closed. It has always seemed to me that the hæmorrhage from the scalp wound in making the primary incision has been very favourable to the object in view, which is to relieve pressure and to prevent permanent destruction of tissue. Operative cranial surgery is, in my opinion, not only justifiable but in well-chosen cases is the only means of scientific treatment, and there is every reason to believe that the early adoption of it would have cured many people who have for want of it proceeded to incurable dementia. The purely medical treatment of insanity has had a long trial and has met with only a partial success. The modern advances in physiology and surgery may well lead us to hope that what has been accomplished with such marked success in the abdomen may be extended to the skull and its contents, for it appears every day to be more certain that in this direction is to be found the remedy for many persons who must otherwise endure the misery of a chronic and hopeless destructive process.

I am, Sirs, yours faithfully,

T. CLAYE SHAW, M.D. Lond., F.R.C.P. Lond.

Harley-street, W., Sept. 8th, 1906.

To the Editors of THE LANCET.

SIRS,—The question put by "M.R.C.S., &c." in THE LANCET of Sept. 8th, p. 682, admits of a precise and unhesitating answer. Ligature of the carotid, for the cure or alleviation of mania, would certainly not be justifiable. If it were certain that the mania was not only accompanied, but caused, by hyperæmia of brain, it would still not be justifiable, for the hyperæmia might be of a passive nature which would require not a less vigorous, but a more vigorous *vis a tergo* for its relief; but there is no evidence at all that mania is caused, or even accompanied, by hyperæmia of the brain, and what evidence we have is rather the other way. In cases in which great hyperæmia of the brain is found post mortem, the ante-mortem symptoms are those not of mania, but of coma, and the brains of those who die in acute mania are not often found deeply congested. That anæmia

of the brain necessarily follows a diminished supply of blood to the organ, is not quite accurate, for the diminished supply may be more than counterbalanced by a still more diminished efflux; and it is certain that symptoms of mental depression, if by this is meant depression of spirits, or melancholy, do not necessarily follow a diminution in the blood-supply to the brain, for melancholy does not necessarily, nor even usually, follow severe hæmorrhage; nor is it a usual concomitant of general anæmia. "M.R.C.S." says that many cases of simple insanity appear to depend almost entirely upon active hyperæmia and increased blood pressure. I usually test by routine the blood pressure of my patients by the sphygmo-hæmometer, and I find that a high blood pressure goes more often with depression of spirits and tranquillity than with excitement; and I would point out that a high pressure of blood in the arteries does not necessarily imply hyperæmia in the tissues, or a more rapid flow of blood through the capillaries. The high pressure may be compensatory, and complementary to some obstruction to the flow of the blood through the small vessels, so that the net result may be a circulation that is not increased, or is even diminished in velocity.

Increased blood pressure may, as "M.R.C.S." asserts, be the main cause of the delirium of persons suffering from pyrexia, and of the mental excitement produced by stimulants, and by the administration of ether and chloroform. I know of no series of measurements of blood pressure in these states to give countenance to the assertion that increased blood pressure is present in them; and if it were proved to be uniformly present, proof would still be wanting that the high blood pressure was the cause of the delirium and excitement. To perform on such grounds as this a capital operation, with risk, not only of life, but of permanent damage to brain, even if life is not lost, would be in my opinion unwarrantable. One other statement, made by "M.R.C.S.," as if it were established fact, seems to me open to question. "In cases of mania," he says, "the more acute the symptoms the greater the cerebral disturbance and insomnia, the more favourable is the prognosis." This is not my experience. I am accustomed to teach that the gravity of an attack of acute insanity, by which I mean the danger to life in the first place, and of permanent alienation of mind in the second, is a product of two factors, viz:—the intensity of the attack, and its duration. If by acuteness of symptoms "M.R.C.S." means brevity of the acute attack, I should agree with him; but if, as appears from his context, he means intensity or severity of the attack, then his experience is the reverse of mine.

I am, Sirs, yours faithfully,

Wimpole-street, W., Sept. 8th. CHAS. MERCIER.

ANÆSTHESIA IN DENTAL SURGERY.

To the Editors of THE LANCET.

SIRS,—In THE LANCET of Sept. 8th I notice a review of the second edition of my little book on the above subject, and while thanking your reviewer for the kind things he has said in regard to it I have pleasure in acceding to his request (or is it a challenge?) and referring him to proof, as far as possible, of the statement made on p. 193 that arrest of the respiration may be due, among other things, to "direct retardation and arrest of the pulmonary circulation, first in the capillaries and then in the larger vessels, due to the local direct action of chloroform."

If your reviewer can get hold of a copy of the "Report of the Discussion on Anæsthetics" of the Glasgow Medico-Chirurgical Society (1891), published by Alex. Macdougall, 81, Buchanan-street, Glasgow, he will find on p. 5 that the late Professor Coats, whose views on the physiological action of chloroform were, I believe, particularly sound, draws attention to this cause of respiratory arrest, basing his remarks on Dr. D. Newman's work when a member of the Glasgow Committee on Anæsthetics. Whether any later observer has confirmed this I am unable to say, but all I wish to contend is that I am not speaking without authority to support me. I have avoided bibliographical references in this book, as I am inclined to think by the average reader they are regarded as a nuisance.

In another journal my remarks on the question of the administration of anæsthetics by a Licentiate in Dental Surgery were dealt with more severely than by your reviewer, the writer evidently regarding me as eminently unsound in this respect. To many London anæsthetists it appears nothing short of heretical to suggest that anæsthetics may be given properly by anyone other than an anæsthetist or "fully qualified medical man." It is, however, perfectly useless to lay down that every man who administers nitrous oxide must be medically qualified. In certain classes of practice it is next to impossible. I live in a country where dentists, until quite recently at all events, even gave chloroform to patients without calling in a medical man. This is, of course, unspeakable and personally I regard the casual administration of ethyl chloride by dentists as only less objectionable. At the same time I would much prefer that patients be given nitrous oxide or mixtures of it with ethyl chloride or ether by a properly trained L.D.S., of whom there are now many about, to their being *chloroformed* by one of my brother M.B.'s. To only too many such anæsthesia still means *chloroform*. I am, Sirs, yours faithfully,

Edinburgh, Sept. 10th. T. D. LUKE.

HÆMATOGENOUS ALBUMINURIA.

To the Editors of THE LANCET.

SIRS,—I have met with three cases of albuminuria in youths of 17 to 20 years during the last few weeks. The administration of from 60 to 80 grains of calcium lactate has completely cleared this up, in one case in a few hours. The other two cases were not examined until an interval of 24 hours had elapsed. I find that a smaller dose than 60 grains is not so definite in its action. Accordingly I can vouch for the value of the work Sir A. E. Wright has performed in solving this often most perplexing problem of functional albuminuria which must have frequently completely changed, if not ruined, the prospects of many a perfectly healthy boy.

I am, Sirs, yours faithfully,

Walbrook, E.C., Sept. 7th, 1906. CHARLES B. PENNY.

WHAT IS A SPECIALIST?

To the Editors of THE LANCET.

SIRS,—Your correspondents who are writing letters under this title do not appear to be confining themselves very strictly to supplying material for answering the question. It is not the definition of a specialist which concerns most of them; rather they are concerned to speculate how far material success is achieved by the practice of specialism, and how far the chances of such success are denied unfairly to many members of the medical profession.

Has your attention been called to a contribution by Dr. Herbert Snow in a monthly journal called the *Grand Magazine?* The paper, which I have reason to believe has disturbed the equanimity of some members of the medical profession, appears to be one of a series on "The Secret of Success," and as the seventh in succession of this series it deals with "Success in Medicine," and purports to be a feast of thought furnished by several contributors, voluntary or involuntary. The names of Sir Dyce Duckworth, Dr. Whipham, Dr. F. W. Andrewes (misspelt), Dr. Wethered, Dr. Herbert Snow, Professor Clifford Allbutt, Mr. Ernest Kingscote, M.B., Miss Aldrich Blake, M.D., Mr. Litton Forbes, Sir James Crichton Browne, and Mr. Brudenell Carter, all appear at the heads of successive paragraphs or pages, and these names are reinforced by anonymity in the shape of "An Eminent London Physician who has received a Baronetcy," and of "Sir X. Z., a well-known London specialist." In the case of several of the gentlemen mentioned it is obvious that their contributions have been involuntary, inasmuch as they consist only of extracts from their published works, but some appear to have written in reply to direct applications from the magazine. Among these, from internal evidence only, I should be inclined to place Dr. Herbert Snow, who may at least claim the merit of having escaped from conventionality. He tells the public that the main elements making for success in the medical profession, ranged in the order of their importance, are unscrupulousness, selfishness, hypocrisy, industry, and ability; that no one with the merest vestige of a conscience should attempt to become a medical practitioner; that everything in the nature of benevolent instincts, of kindly feeling for others, of sympathy with suffering and pain, should be sternly discouraged; and that in country districts it is advisable further to varnish your real sentiments by a cloak of religious hypocrisy. If Dr. Snow believes that these are the conditions mainly contributory to success he must believe also that the most successful members of the profession are men who have

practised what he preaches. He may certainly be said to call down upon himself the condemnation generally extended to birds that foul their own nests.

The "Eminent London Physician who has received a Baronetcy" is delicious. Assuming that a person answering this description may have been asked to contribute, the application must have been thrown into the waste-paper basket and picked out by a manservant who has amused himself by giving his own version of his employer's experiences and opinions. "Jeames" is writ large over the whole of the composition. According to his story, the eminent physician is not a physician at all but a surgeon, and he became full surgeon to a "great and famous hospital" within seven years of obtaining a "minor" appointment there! He stepped into sudden notoriety by a "trivial operation" upon a well-known statesman, to whose bedside he was called in consultation. The medical "Jeames" has so far had no justice done to him in fiction, and this particular specimen ought to be induced to publish his reminiscences for the delight of mankind. Many of us could contribute an anecdote or two to such an autobiography. A friend of mine had occasion to go often to an "eminent physician," and said to Jeames, "You will be tired of opening the door to me." "Not at all, sir," was the gracious reply; "you are but a hunit in the hocean." Another Jeames was accustomed to say, during his master's occasional absences: "you had better try hopposite. There's a very respectable man hopposite as we often sends to when Sir William is habsent. His name is Jenner."

Mr. Ernest Kingscote begins by taking an absolutely irrelevant story from Sir Walter Scott and spoiling it in the telling. The hero of the original story was so far from being an Aberdeen graduate that he had not any sort of medical qualification. When Sir Walter was sheriff-depute of Selkirkshire an illiterate farrier in the district, who was charged with some minor offence, got away across the border, and a year or two afterwards Sir Walter met him accidentally in Carlisle and asked what he was doing. The man said he was practising as a doctor and told the well-known "calamy and lodomy" story with the conclusion about Flodden Field. There is no evidence that he was successful, especially as Mr. Kingscote defines "success," that is, as a "lucrative practice with congenial social surroundings." Mr. Kingscote tabulates a little catalogue of ordinary requirements in the way of "sufficient ability," "astute business instinct," &c., and provokes a quotation from Scott of quite a different character from his own:—

> "So think the vulgar. Life and Time,
> Ring all their joys in one dull chime,
> Of luxury and ease."

Part of Mr. Kingscote's advice is to avoid originality, but in quoting a precept from Assheton Smith he spells the famous sportsman's name in quite an original manner.

The passages of this extraordinary medley which appear to be editorial cuttings from books or introductory addresses are all in what lawyers, I believe, call "common form," and contain the usual recommendations to the practice of sundry prosaic virtues. But "Sir X. Z., a well-known London specialist," merits comment, as he, like your correspondents, is contributing information as to what a specialist may be. It is interesting to know that "*when* he commenced practice he passed *with distinction* all the usual examinations." Most people pass some of the usual examinations before they commence practice, and they are not informed by the examiners whether they have passed with distinction or without. In spite of his "distinction" X. Z. appears to have found himself only "one of hundreds more or less clever men," "a hunit in the hocean," in fact; and he decided to become a "specialist" because as a general physician he would have been "unable to address himself to the public." He selected a specialty "which appealed to a large class of persons, and in which a fair proportion of cases were curable," and he does not on his own showing appear to have made any endeavour to equip himself with any unusual amount of knowledge of the subjects to which his attention was professedly directed. He seems to have calculated that the recoveries of the many people who got well would be credited to his superhuman skill, and that the condition of those who did not get well would be attributed to the neglect or the want of skill of the general practitioners with whom he was associated in treating them, and of whom he was manifestly ready to make scapegoats. He is of opinion not only that specialism is the best road to success, but also that any specialty may easily be made subservient to the advancement of the man who professes it. All that is necessary is to write as much as possible in lay papers and medical periodicals, to belong to, or if necessary, start some special hospital, and, above all, to entertain as largely as possible both the rank and file of the profession and the public. It seems impossible to believe that "Sir X. Z." is a real person, but if he be a creature of the editor's imagination the medical profession has a right to resent such a picture being presented to the public as a medical portrait. "Sir X. Z.'s" self-satisfaction with his own dishonesty is amusing; it is equal to that of Gil Blas.

This autobiography of a successful specialist would seem to me to be too preposterous for credence, even in a popular lay magazine, making not the slightest appeal to intellectual people, if I did not detect in the letters of some, at least one, of your correspondents a tendency to believe that such charlatans were a force in our professional ranks. I can claim a not inconsiderable acquaintance with medical practitioners, many of them eminently successful; some, in a sense, unsuccessful, and these by no means always the least capable, but it is common experience that the ignorant and dishonest men, such as the "Sir X. Z." of the *Grand Magazine*, will almost invariably fulfil the tradition about the porcine race, that they cut their throats in swimming. It is of high advantage to be "clever," to make use of a much abused word; but it is quite possible to be "too clever by half," and in that case detection and extinction are apt to follow as cause and effect. I am, Sirs, yours faithfully,

F.R.C.S.

To the Editors of THE LANCET.

SIRS,—The interesting correspondence under this heading should have a useful issue if it not only brings to general notice the many difficulties of the present position but also enables us to see a way out. Personally, I do not think we need trouble ourselves about smoothing the path for the man whose claim to being a specialist rests on his own opinion of himself. Nor need we try to make it easy for him to secure the comfort and affluence which he imagines to be the reward of specialism. It is true that in a few instances such a man's estimate of himself may be well-founded and his failure to reap his reward may be a real loss to the community. But in the vast majority of cases such a man's claims to special capacity are as illusory as are the rewards he believes to be within his grasp if he could obtain the position he desires.

What we as a profession are more concerned with is the undoubted failure of the public to secure the advantages that it ought to secure from the particular knowledge and skill of those whose claims to specialism rests on the well-founded opinion of their fellow practitioners. From want of proper organisation of the profession a very considerable number of patients, whose simple ailments do not require it, are under treatment by men whose colleagues would unhesitatingly acclaim them as specialists, whilst still larger numbers are deprived of the services of these same specialists though their prospects of rapid recovery would certainly be increased by such help. I believe this to be due to the fundamental error as to the true basis of "specialised practice." In modern medical ethics the chief crime of a specialist is that he wanders from his speciality and treats cases not strictly within his scope. In the opinion of some it would be better if it became the chief crime of a specialist to treat any patient independently. The special knowledge of a specialist should be used not to attract members of the public to seek his aid, it should be at the disposal of other members of the profession to assist or to supplement their therapeutic efforts. I have satisfied myself that the fact that nearly all specialists, including in this term the special physician and special surgeon, as well as the eye, ear, and throat specialist, undertake independent private practice is an undoubted bar to that free use of their services which would be made by general practitioners if they restricted their work to consultations with their colleagues and to treatment carried out in coöperation with them. The introduction of a patient to Harpole-street often proves a very expensive experiment for a general practitioner. The specialist to whom the patient is sent may be scrupulous beyond reproach in his method of dealing with the case, but there are many other door-plates in the neighbourhood, and so long as specialists undertake independent treatment of cases that "come on their own," as the saying is, the danger of a patient and his

friends and acquaintances acquiring a Harpole-street habit is a serious one.

There have always been a few specialists who have taken up the strictly consultative attitude and their numbers are said to be slowly increasing. If this attitude became common amongst those who are attached to the great hospitals of London it would no doubt spread to all those centres of population capable of supporting specialists. It can hardly be doubted that this would be to the advantage of the specialists themselves, of the general practitioners, and of those members of the public who have real need of the experience that can only be acquired by specialisation. It would settle once for all that the proper answer to the question, What is a specialist? is one who is so regarded by his professional colleagues. It would make it clear to the public that the profession did not regard as a specialist one who undertook to carry out treatment independently of a general practitioner. It would make it more than ever useless for a man whose colleagues did not recognise his claims as a specialist to announce that he was one on his door-plate.

I am, Sirs, yours faithfully,

Sept. 10th, 1906. E.

PORTUGUESE QUARANTINE REGULATIONS.

(FROM OUR SPECIAL SANITARY COMMISSIONER.)

PART II.[1]

THE NEW MARITIME DISINFECTING STATION AT LISBON.—THE NEW HARBOUR WORKS.—THE BRITISH MEMBERS OF THE INTERNATIONAL MEDICAL CONGRESS AND THE "OPHIR" BLUNDER.—THE OLD LAZARET FORT AND PRISON.—THE MODERN LAZARET.

THE port of Lisbon, if considered from the point of view of the number of ships by which it is frequented, may be estimated as the twelfth in importance of all the ports of Europe. This is due in a large measure to its continual communications with the Brazils. Here, then, was established a large lazaret and its history, a somewhat sinister history, dates back for some centuries. It is situated on the left bank of the Tagus at some distance from Lisbon, nearer to the sea and nearly opposite the famous Belem tower. The importance of this lazaret may be judged from the fact that for purposes of quarantine or of disinfection of luggage in the course of ten years from 1890 to 1900 the number of persons detained here reached a total of 96,423. Now the lazaret is to a large extent abandoned and this is one among several good results which the meeting of the Fifteenth International Congress of Medicine at Lisbon helped to bring about. A maritime disinfecting station has been built at Lisbon itself and its completion was hurried forward so that everything should be in working order when the members of the Congress arrived. The station forms a part of the great scheme of the new harbour works and was opened towards the close of the year 1905. In most respects it is similar to the disinfecting station established at Leixoes and previously described. Formerly ships had to go to the lazaret on the other side of the Tagus. Here the travellers were exploited by boatmen. The water was often rough and then the boatmen would charge high prices for landing the passengers. There were many hardships and much loss of time. Now these annoyances are avoided except when quarantine detention is actually imposed and then there is no need to hurry, for there is more time than enough. This, however, only applies to infected ships. In most cases medical inspection and disinfection alone are necessary, and then, as a result of the harbour works, the ship can moor alongside of the new disinfection station. Even at low tide there are eight metres of water, so that very large ships can come alongside.

It was against this wall and close to the disinfecting station that arrangements had been made to moor the Orient Line steamer *Ophir* which was chartered to convey the greater part of the British members of the Fifteenth International Medical Congress to Lisbon. The water here is deep and pure—that is to say, there are no sewer outfalls anywhere in the neighbourhood. On the contrary, from a point near to the arsenal right away some distance on the road to the Belem tower, a main collecting sewer has been built within the new embankment. Here on this embankment an electric tram would have taken the passengers residing on the *Ophir* to the centre of the town in a few minutes, while under the embankment a main sewer conveys all sewage far away towards the sea. The appended map shows well the details I am describing (see Fig. 2). On the other side of the Commercial, or the so-called "Black Horse Square," where the *Ophir* eventually rode at anchor, are several of the worst sewer outfalls of Lisbon—indeed, the whole question of the *Ophir* is so utterly to the discredit of British management that it should not be forgotten but should be constantly recalled as a lesson and a warning for the future. It will be remembered that a scare was raised about sewer outfalls and therefore the British contingent, through their representatives, declared that they did not wish their ship to come alongside of the quay. The mooring place secured for them was consequently given up, and of course the Germans, being as usual very much better informed, eagerly availed themselves of the opportunity to secure this excellent berth for their ship the *Oceana* (see Fig. 3). Surely, before thus rashly giving up a favoured position a map of the sewers could have been procured. There was no difficulty in obtaining such a map. This map shows that where the *Ophir* should have been moored, and where Dr. Henry de Rothschild moored his yacht the *Nemesis* and the Germans their ship *Oceana*, there are no sewer outfalls whatsoever. The *Ophir*, however, and to avoid sewer outfalls where they did not exist, went to a most inconvenient position and this facing a district where they did exist—in fact, they cast anchor just opposite no less than five large sewer outfalls. Fortunately, there is so much water and the *Ophir* was so far from the shore that these five sewer-mouths were not likely to do any harm, but each time members of the British contingent went to shore in rowing boats or in a tender they had to navigate through the sewage. To land at "Black Horse Square" they had to pass close to the mouth of one of the most obnoxious and odoriferous of these sewer outfalls. If in spite of the enormous volume of salt water in the Tagus those sewer outfalls that still remain occasion any risk to persons on board ships then the *Ophir* anchored where the risk was greater than if she had gone alongside as originally intended. ("Black Horse Square" is marked in the map just to the N. and W. of the fifth s marking sewer outfalls counting from the right or eastern side of the map.)

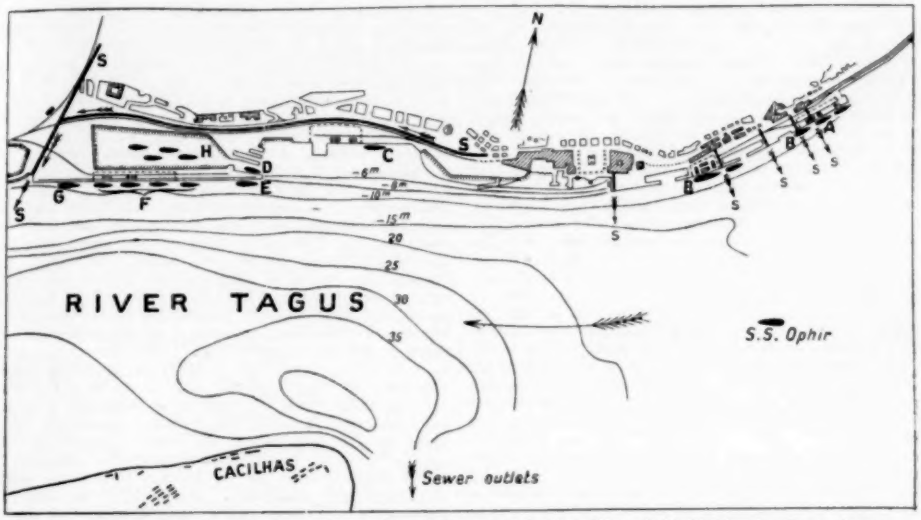
The new harbour works at Lisbon have involved an expenditure of £2,880,000, and an embankment some five miles long has been built together with basins, graving docks, and vertical quays accessible to the largest ships at whatever state of the tide. There is a vertical quay 10,240 feet in length with 26 feet 3 inches of water at low tide. These great works will undoubtedly have some effect upon the health of the town. Not only is a large portion of the sewage conveyed away by the main sewer laid in the embankment, but this building, by drying up the land and preventing the exposure of mud at low tide, has put an end to the excessive prevalence of low fever among those who lived close to the water's edge. The mortality from typhoid fever, taking the average for periods of four years each, was equal to 0·38 per 1000 inhabitants annually from 1881 to 1885. During the next four years it was 0·35 per 1000. The new harbour works were commenced in 1892 and concluded in 1898. For the period 1891 to 1895 the maximum deaths from typhoid fever was reached, the proportion being 0·39 per 1000. Then as the works approached completion the figures fell to 0·29 per 1000 from 1898 to 1900 and to only 0·21 per 1000 from 1901 to 1905. It does not follow that the harbour works have brought about this reduction in typhoid fever, but the digging and the disturbance of the earth while the works were going on do seem to have increased the number of cases. On the other hand, the better sanitation resulting from the completion of the works was doubtless one of the contributory causes of the present falling off in the number of deaths from that disease.

The new maritime disinfecting station has been built on a portion of the vertical quay to the west of Lisbon, and at the base of the hill where the Royal palace of Necessidados is situated. The railway lines are laid here so that goods can be loaded on the trucks as soon as they have been disinfected. From the disinfecting station luggage can be sent direct to any part of Europe. It is not necessary after landing

[1] Part I. was published in THE LANCET of Sept. 8th, p. 684.

from a ship to take it to a railway station in Lisbon. Soon a railway station will be built here and then passengers will be able to take their tickets and depart without penetrating the city. At present, however, only the line exists and not the railway station. But there is a post and telegraph office, so that the passengers can at once communicate with their friends, and there are stationery and desks ready for them in the waiting-rooms.

FIG. 2.



A, Cunard Line. B, Nacional Line. s Sewer outlets. S, Sewer. C, Insulana Line. D, Yacht *Nemesis*. E, s.s. *Oceana*. F, Coal and timber boats. G, Messageries Maritimes. H, Small boats lying in the Alcantara basin.

FIG. 3.

The new maritime disinfecting station at Lisbon. In the distance, with display of flags, the s.s. *Oceana* moored alongside of the new sea wall, and having on board the German contingent of the Fifteenth International Congress of Medicine.

The first-class waiting-room has a parquetted floor and all necessary comforts. The medical officers and the secretaries have commodious surgeries and offices and, as at Oporto, there are the baths with rooms on one side in which to undress and rooms on the other side where the disinfected clothing is put on. The same is provided for the attendants, the dock labourers, and all who have to handle the clothes or merchandise that may be infected. Throughout, here as at Leixoes, there are excellent English closets, with a two-gallon flush, which drain into Mouras tanks, the overflow going to the harbour. Leather or hides and other articles that are more likely to carry germs are in preference disinfected at the lazaret on the other side of the Tagus. At Lisbon the Clayton apparatus, and it is of the largest model, stands on shore. As the ships come alongside it is easy by tubes to put it in connexion with the hold or cabins which have to be disinfected. On shore there are six large rooms where goods may be spread out; perforated pipes go all round these places and discharge sulphurous fumes. There are also apertures in the wall where ordinary sulphur can be ignited. Then there are some small rooms which are used when there is not much to fumigate. Three

Geneste and Herscher stoves for disinfecting with steam under pressure are generally used for clothes, underclothes, and bedding, and these are of the most recent pattern. The wall and flooring are so arranged as to be easily washed. The fittings are mostly of metal so that the premises can be kept in a clean aseptic condition. Finally, there are some small barracks for soldiers and custom-house officials which are admirably clean and well drained. The building throughout is illuminated with electricity and there is nothing gloomy, forbidding, or unpleasant about the place.

Very different, indeed, is the impression that will be produced upon anyone who visits the old lazaret on the other side of the water. The experience is all the more interesting as different stages through which the practice of quarantine has passed may be seen in a manner that constitutes a genuine object-lesson. The approach from the water is most picturesque. Just where the broad Tagus narrows as it nears the sea the Moors, to defend the entrance of the Lisbon waters, constructed on the northern side a fortress where to-day the majestic Belem Tower stands. On the southern side, just opposite this tower, the Portuguese built the fortress of St. Sebastian Caparica which constituted a part of the military defence of Lisbon up to 1815, when it was converted into the sanitary defence of the capital. Before that date the quarantine station was in the little village of Trafaria which is in the immediate neighbourhood but nearer the mouth of the river. In the casemates of the fort unfortunate travellers were kept in quarantine. As these places are so built as to protect soldiers from shot or shell they have but small entrances and little light or ventilation. Nor were any artificial means employed to pump air to the farther end of these narrow casemates which look like dungeons and have no windows. To be imprisoned in such places was certainly enough to favour the development of many diseases.

Approaching the lazaret in the steam launch of the port sanitary authority this fort is seen poised on the edge of a precipitous yellow sandstone rock. Lower down, as well as on ledges towards the summit of the cliff, there is some luxuriant vegetation in which eucalyptus trees predominate. At the foot of the hill and cliff there are a great number of low buildings and sheds. Here merchandise was disinfected. But only small boats and barges can approach the little landing-stage. It must have been a great trouble and expense to unload in barges or tenders the cargo of a ship at anchor and the luggage of passengers, to bring it all to shore, and then to take it back again to the ship after disinfection. The passengers had to walk up the hill between walls 30 to 40 feet high that block out all view of the surrounding country. Nor is it possible to see more than a few yards in front or behind for the passage between the walls twists and twirls. At each corner or turn there is a sentinel box. This was deemed necessary to guard the approach to the fortress. But when finally one of the terraces of the fort is reached then a sublime view of the Tagus is obtained, disclosing fleets at anchor in the blue waters and beyond the white glare of the houses and palaces of Lisbon. How tantalising such a view must have been to the quarantine prisoners. But the old casemates of this fortress are only shown as curiosities, as historical mementoes of the harsh measures formerly applied. A small portion of the fort, which is more like an ordinary house and was probably originally intended for the officers' quarters, is still used, but only on rare occasions, for purposes of isolation. Here I was shown the two sombre rooms where, in 1899, the medical officer in charge lived in strict isolation during 21 days with a soldier who came from Oporto and was found to be suffering from plague. Here also a professor who contracted the plague was confined. It was not thought that such rigorous isolation was necessary; but a great panic prevailed at that moment, and it was more for the sake of quieting the people at Lisbon than because there was any real danger that these exaggerated precautions were taken.

The lazaret that is now in use stands behind the picturesque and threatening fortress. Though the construction was commenced as far back as 1860, and though the building was inaugurated in 1865, it is still considered a model institution. While the fort is on the crest of the precipitous rock or cliff the lazaret is at a higher level on the top of the hill which caps the rock. In design it may be compared to a wheel which has seven spokes, each consisting of long buildings of three or four storeys high, of which six are furnished for the reception of travellers and the seventh for the staff. The whole construction is like a succession of oblong or pavilion-shaped hotels all pointing to the one and same centre but separated from each other. A circular central structure that may be called the hub of the wheel plays a very important part in the scheme. Here on the ground floor are the kitchen, sculleries, and all that relates to the feeding of the community. But the spokes of the wheel instead of penetrating the hub are separated from it by a space or circular court six metres wide. The first floor above the kitchen is a large circular hall surrounded by windows which face the windows at the extremities of seven long pavilions. Here visitors are admitted and across the open space of the circular court they may speak to the persons in quarantine. Thus from the hub of the wheel the visitor shouts to the inhabitants of the spokes of the wheel whatever he may have to say. It is an ingenious method of keeping people apart and yet of enabling them to see and speak to each other. The windows are protected by strong wire grating, so that nothing should be thrown across. On one occasion there were 1500 persons simultaneously in quarantine in these buildings and a greater number could have been accommodated. But now as quarantine is so rarely enforced the place has a very deserted aspect. Nevertheless, in one dining-room the table was all ready laid for some 30 or 40 people and there were cooks in the kitchen ready to prepare dinner for them. At any moment an infected ship might come into port and its crew and passengers have to be detained. The third-class passengers sleep in long dormitories under the roof on the top floor. It seemed to me that if all the beds were occupied there would be overcrowding. The first-class passengers have drawing-rooms and terraces commanding panoramic views and it cannot be said that there is any hardship in being detained for a few days on so beautiful a spot. It is not like the old, dark, long, narrow casemates with their plank beds at the foot of each wall. No great hardship is now involved in being detained, still the question may be asked whether detention of healthy passengers might not be abandoned altogether. From 1880 to 1901 196,457 passengers and crews have been detained at the Lisbon lazaret. What illness of a dangerous character occurred among all these people after they had landed? Five cases of yellow fever are recorded; the last happened in 1902. And all the five patients were members of ships' crews and not passengers, and were probably ill before they landed. In the same way there was one sailor who had cholera in 1893. The few cases of plague observed seemed to indicate that the disease had been contracted on board and not at the infected ports, and this not by passengers but by handling cargo. So now much attention is devoted to the disinfection of merchandise, of luggage, of personal linen, and the killing of rats and other vermin, which is probably much more useful than detaining passengers in quarantine. Thus is Portugal coming into line with the most advanced countries so far as the question of quarantine is concerned.

MANCHESTER.

(FROM OUR OWN CORRESPONDENT.)

Colony for Epileptics at Langho.

As was mentioned last week, a new colony for epileptics was opened at Langho on Sept. 3rd by the Earl of Derby, Lord Lieutenant of Lancashire. It is the outcome of a joint scheme promoted by the guardians of the Chorlton union and those of the township of Manchester. There have, of course, been privately supported institutions of a similar character but this is the first public epileptic home in the country. It is in an open situation near Whalley in the valley of the Ribble. The present buildings will accommodate 272 patients with the necessary staff, but there is room for large extensions as they may be required. There are separate "homes" for the patients, each containing 40 beds, and they are designed to have, as far as possible, "a cheerful domestic character." Although a family of 40 requires a considerable enlargement of our notions of the domestic hearth, the change will be a happy one for the inmates, who have so far had to be accommodated in the necessarily somewhat unsympathetic refuge of the workhouses. The unsatisfactory results to themselves and the other inmates have led the guardians to attempt to deal with the difficult problem of the epileptics on a

humane and, it is believed, scientific basis. It is a step in the direction of more careful classification of workhouse patients. The estate at Langho comprises 166 acres of elevated and undulating land, with extensive views of the surrounding country. There are 16 buildings now erected. The administrative block is in a central position, while there are a receiving and hospital block, an assembly hall, a central kitchen and store block, medical superintendent's house, a power house, general laundry block, with workshops for brushmakers, upholsterers, carpenters, tailors, shoemakers, and plumbers. The homes are in groups to the right and left of the administrative buildings, and are fitted up on the most approved principles. The cost, with administrative capacity for about 500 patients, is £78,500, which, with the cost of the site, brings it to about £100,000. The lighting is by electricity generated in the power house and water is obtained from the Blackburn main. After the opening ceremony a luncheon took place, presided over by Dr. J. M. Rhodes. In proposing the health of Lord Derby, he spoke of the unhappy lot of epileptics, whether in or outside our workhouses. Employments were almost, and where machinery was used, quite closed to them. Since 1890 the rate of epilepsy had been declining, and "he was not sure that the enormous number of people in the asylums had not prevented the multiplication of the unfit. He hoped it was so. Many epileptics could do good hard work, and the best kind for them—work on the land—would be provided at that colony."

Black Smoke in Bury.

People who live in a smoky town get so accustomed to it that they are nearly unconscious of the serious evils that accompany the pouring out of unconsumed carbon with its tarry associates. The Bury town council passed a resolution recently to restrict the emission of black smoke to seven minutes during the hour instead of allowing ten minutes as at present. At a meeting on Sept. 6th some of the members thought the time allowed too short and that they should have eight minutes' grace. One of the medical members, Dr. Greenhalgh, said that he could not understand this tender consideration in regard to the question of black smoke. Personally, he thought that it should be abolished and it might easily be reduced to a minimum. No doubt he is right, and it seems discreditable that such a nuisance as black smoke should, in these days of advanced science, be allowed to pollute and defile so much of the manufacturing districts. Even Manchester, not reputed a smokeless town, only allows three minutes to the hour, but it is only fair to give credit to Salford, which apparently loves smoke more than her neighbour, and therefore gives a more liberal allowance of time for the emission of black fumes which roll over Manchester regardless of the dark boundary, the Irwell.

Antivaccinationists' Refuge.

To show how well Heywood deserves the title sometimes given to it of the antivaccinationists' refuge it is only necessary to mention the proceedings of one day about a fortnight since. A man came from Audley, Staffordshire, and said that he came purposely to get "the certificate," which was granted. Certificates were also granted to 15 other applicants from Bury, Summerseat, Newton Heath, Levenshulme, Radcliffe, and Pendleton.

Sept. 11th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

The Etiology of Plague.

THE opening lecture of the post-graduate course in connexion with the Glasgow Royal Infirmary was delivered on the afternoon of Sept. 4th by Major George Lamb, I.M.S., director of the Pasteur Institute of India and chief of the Royal Commission on Plague. The lecture, which was largely attended, dealt with the Etiology of Plague. Major Lamb first drew attention to the main conclusions which are generally accepted in connexion with the epidemiology of plague. These, he said, are: (1) Plague, except in the pneumonic form, is not particularly infectious or contagious, and man-to-man infection plays no important part in the spread of the disease in India; (2) the infection of plague is in the houses and huts and may remain there for some time; (3) plague, when once started, exhibits a most marked seasonal prevalence; (4) epidemic plague is associated with, and generally preceded by, an epizootic amongst rats. The lecturer next went on to discuss the possible means of the spread of plague from rat to rat and from rat to man. He showed from experimental and statistical evidence that alimentary infection does not take place. Further, he showed that all the facts pointed to the infection of plague finding an entrance to the body through the cutaneous surface. In discussing the methods by means of which cutaneous infection might take place it was definitely showed that infection from the soil through cracks or abrasions of the skin of the foot could play no part in the spread of the disease. Major Lamb then described in considerable detail the series of investigations and ingenious experiments he had carried out, as a result of which it seemed impossible to escape the conviction that the rat flea was the means by which infection is carried from rat to rat and from man to man. The work which the commission still has to face is to find how the flea transmits the infection, and also to discover an explanation for the seasonal prevalence of the plague. Major Lamb, in conclusion, stated that the rat which occurs in Britain is the brown Norwegian rat and not the black rat of India, and it is probably on that account that there has been no serious outbreak of plague in this country. The particular flea which carries the infection has been found only once in this country.

The West of Scotland Convalescent Home, Dunoon.

The thirty-seventh annual report of this institution has just been issued by the directors. Up to the present time since the opening of the home 110,357 patients have been admitted. At present there is accommodation for 250 convalescents, and during the past year 4756 new cases were received. Of these 4433 were perfectly restored to health, 188 were much improved, 132 did not improve, three died, and 248 are still in the institution. The greater number of the patients were drawn from the city of Glasgow, but a considerable proportion came from villages and towns many miles distant. Financially, the year has been a most successful one. The total income from all sources has been £9310 12*s.* 7*d.*, while the expenditure (including a transference of £2000 from ordinary bank account to the fund available for building purposes) has been £8762 2*s.* 2*d.* This leaves a balance of £548 10*s.* 5*d.* on the right side. Owing to the great demand for admission the directors have decided again to add to their extensive buildings. The new wing will provide 57 additional beds, as well as increased facilities for the working of the institution. This will cost nearly £6000 and will be the sixth addition to the buildings since their inauguration in 1869. It is pointed out in the report that although in summer there are more applicants for admission than can be accommodated yet in winter this is by no means the case.

Sept. 11th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Dublin Sanitary Association.

THE council of the Dublin Sanitary Association met at its offices in Dame-street on Sept. 7th and directed attention to the number of private slaughter-houses still existent in the city. The corporation is now provided with an admirable public abattoir, but comparatively little use is made of it, for there are at present 61 private slaughter-houses in which, according to a recent weekly return, 2872 animals were killed, while less than 700 were dealt with at the corporation establishment.

Sequel to the Longford County Infirmary Inquiry.

Another meeting of the committee of management of the Longford Infirmary was held on Sept. 5th, Dr. Hoare, the Roman Catholic Bishop, presiding. With reference to Mr. Mayne's report to the Local Government Board as to the insanitary state of the infirmary and to the necessity that the wards should be properly disinfected, Mr. J. W. Bond proposed a motion:—

That some competent person be asked to make a report as to the work necessary for the disinfection and cleansing of the infirmary, with information also as to the probable cost.

The chairman proposed as an amendment:—

That the workhouse hospital may be utilised until a solution of the present difficulty is found.

This amendment was lost and by consent the county surveyor was accepted as the person who should report on the repairs necessary to the infirmary, and Mr. Bond's motion was carried.

Medical Officer of Health of Belfast.

At a meeting of the corporation of Belfast in committee, held on Sept. 5th, the question of the salary to be paid to the new medical officer of health was considered. The council had previously fixed £600 a year but the Local Government Board objected that this was too small for a city of the size and importance of Belfast and requested the council to reconsider the manner. Hence the meeting of Sept. 5th. The chairman of the public health committee moved :—

That it be a recommendation to the council to rescind the resolution passed on July 2nd fixing the salary of the medical superintendent officer of health at £600 and to fix the salary of that office at £800 per annum.

An amendment reaffirming the salary of £600 fixed by the council was moved and on a vote it was carried by 26 to 11 votes. As a result we have a salary of £600 a year offered for a medical officer of health in a city of 348,965 inhabitants. Nor is this all. The medical officer of health of Belfast will have to provide the solution of almost every public-health question that has been settled in other cities, such as the main drainage of the city, the defective housing, the control of the milk-supply, infantile mortality, and prevalence of tuberculosis. Imagine a city the largest in population in Ireland paying (for example) its coroner, who is allowed private practice, more than its medical officer of health who must devote all his time to the duties. Interest now turns on what the Local Government Board will do; it will not be surprising if it refused to sanction the benighted action of the Belfast corporation.

The Recent Heat Wave.

Nothing could be more satisfactory than the ventilation of the new Royal Victoria Hospital during the recent warm weather. The highest shade temperature recorded outside the hospital in Belfast was 85° F. and on that day the inside temperature of the Royal Victoria Hospital was 67°. Thanks to the admirable working of the plenum system another pleasing feature was the total absence of flies.

Rainfall in August.

During August, in the vicinity of Belfast, rain fell on 22 days to the extent of 5·47 inches; that is almost one inch beyond the average for that month. The total rainfall for the past year is 26·99 inches, which is more than one inch beyond the average.

Sept. 11th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Treatment of Acute Inflammatory Affections of the Intestine by Warm Baths.

AT a meeting of the French Association for the Advancement of Sciences held at Lyons from August 2nd to 7th Dr. Pujo reminded the meeting that the treatment of acute affections of the intestine has now for many years resolved itself almost exclusively into the use of ice and opium or else operation. Dr. Pujo recommended the warm bath of which the temperature should vary according to the season. The baths should be given frequently during a period of two hours followed by a similar period in bed. These alternations should be continued until the point of concentration of the disease has been dispersed, a result which obtains in a few days. Dr. Pujo has met with invariable success, and out of over 60 cases, 20 at least showed marked signs of true appendicitis and some of them of suppurative appendicitis. In this latter case quinine was given as well as the baths, and he also found it useful occasionally to give opium and calomel in addition. Naturally this method of treatment demands the most careful precautions as to placing the patient in the bath. No sudden movement should be allowed and the patient should be kept straightened out as far as possible, only not so straight as to bring about compression of the lower part of the abdomen.

The Hæmopoietic Property of Serum.

At the same meeting M. P. Carnot and Mlle. Defiandre communicated the result of some researches which they had undertaken as to the cause of the renovation of the blood in bleeding. The result of these researches had been to confirm the presence in the serum of animals which had been bled of a substance capable of stimulating hæmopoiesis, and this substance they propose to call hæmopoietin as opposed to hæmolysin. Their experiments were carried out on the rabbit, and they found that if a rabbit was copiously bled, and that on the following day serum was taken from one of these animals then in the full tide of making fresh blood, and if this serum were injected into another rabbit, the latter on the following day showed marked hyperglobuly. As a rule, the red corpuscles showed 3,000,000 per cubic millimetre but a much higher rate was obtained in some cases. In one, for instance, on the third day the figure was 6,000,000. Compared with the hæmopoietic activity of the blood or serum collected during the full tide of blood renovation that of normal blood or serum is very weak. If the same animal is too frequently bled the hæmopoietic activity of the serum diminishes and finally it is replaced by hæmolytic activity. It is probable that in the normal state these two factors counterbalance one another and that under the influence of certain factors sometimes one and sometimes the other predominates. M. Carnot and Mlle. Defiandre added that the hæmopoietic substance is not found in the figured elements of the blood but in the serum. It is destroyed at a temperature of 56° C. and is most abundant in the blood on the morrow of a bleeding. Administration of it by subcutaneous injection is just as efficacious as when given intravenously. They consider that this treatment may be of great therapeutical use in certain cases of anæmia, and, in fact, in a case treated in this way they observed an augmentation of the red blood corpuscles running up to 1,000,000 in 48 hours.

The Fight against Lead Poisoning.

Professor Armand Gautier has just submitted to the Council of Hygiene and Public Health of the Seine a report upon cases of lead poisoning observed in the course of the last three years. The number of cases of lead poisoning in 1903 doubled in 1904 and for 1905 it doubled again. Professor Gautier concludes that white lead should be absolutely forbidden for painting the insides of buildings, but as far as regards the outside of buildings he expresses himself willing to wait until the Expert Commission nominated by the Minister of Commerce has sent in its report.

Sept. 11th.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Restrictions on Experimental Treatment in Hospitals.

AT a recent meeting of the Medical Union of Vienna there was an animated discussion on an ordinance which has just been issued by the Minister of the Interior regarding the use of new methods of treatment in the case of hospital patients. This ordinance directs that experiments with new remedies or new methods are not to be made unless the patient has been previously informed of the fact and has given his consent. A full record must be kept showing all the details of the experiment as well as the names of the experimenters, assistants, and patients. The director of the clinic or the ward must either be present or must in some way supervise the whole proceedings, and a full report must be sent to the hospital director. Novel surgical operations must have been tried on animals before being employed for patients. Such methods may, however, be used in cases of emergency if previous methods of operating are dangerous or are likely to be unsuccessful. The Austrian law is somewhat strict in defining the liability of a medical practitioner towards his patient; the penalties for neglect are regulated by paragraph 1325, which may be quoted here as the new regulation expressly calls attention to its existence. It is to the effect that anyone who inflicts bodily injury on another person must pay all the expenses of the medical attendance and medicine, as well as any other outlay incurred by the injured person in consequence of the injury. The injured person may claim compensation for the pain sustained through such act and also compensation for loss of income, or he may claim, if he becomes permanently unfit for work, a sum equivalent to the loss of his future income. Paragraph 1327 makes the person who inflicts the injury responsible to the family of the injured person

if the latter dies through such an act, by awarding them a certain sum as compensation. A medical man may also become responsible to a patient under the Civil Code, paragraph 355, the so-called paragraph *contra leges artis*, which stipulates that if a medical man shows gross professional ignorance in treating patients, and if such ignorance results in harm to the patient his diploma may be cancelled and he may be struck off the list of men entitled to practise medicine until he proves by passing an examination that he has a sufficient knowledge of his profession. If death results from such neglect imprisonment for a period varying from one month to one year may be inflicted upon him in addition to the financial responsibility. The law therefore is careful to protect the patient against the practitioner, but, on the other hand, the practitioner has hardly any protection against his patients. It is to be expected that the recent ordinance will not interfere materially with the scientific work going on in the clinics. It is in reality a concession to an influential section of the population, consisting of persons favourably inclined to the antivivisectionist movement. It will, however, serve as a valuable check upon some indefensible experiments which are made now and then.

Reform of the Out-patient Department in the State Hospitals.

The governor of Lower Austria, as chief of the board of the State hospitals, is now introducing a long-desired reform. The main feature of the new system is the prevention of abuse of the hospitals by the wealthier classes and for this purpose an Armutszeugnis, or documentary evidence of inability to pay medical fees, must be shown by the applicant. Such evidence is obtainable from the landlord of the house where the applicant lives or from the guardians of the poor in each district and must prove that the applicant's rent is less than 600 kronen (£25) and that his income does not exceed £100 a year. On presentation of this document the applicant receives at the hospital a card admitting him to the out-patient department. Persons in easy circumstances will in this way be prevented from attending the hospitals and those who are in the service of shopkeepers, manufacturers, and similar employers of labour will have to be attended by practitioners engaged in accordance with the Employers' Medical Provision Act of 1889, under which all persons occupying posts in business houses are entitled to medical attendance. (This Act itself is an old source of grievance amongst the bulk of the practitioners.) Domestic servants, also, who form a large proportion of the out-patients, will in future be debarred and will have to look to their employers to obtain medical attendance for them. Exceptions are granted if the treatment requires special apparatus, special knowledge, or a very long time, and also in cases of emergency, but in such circumstances moderate payments may be claimed from well-to-do persons. Discharged in-patients may continue as out-patients until their recovery. Bandages will be given for use in the hospitals but not for use at home, and no medicine will be supplied except to patients unable to pay for it. Infectious cases will be referred to the isolation hospitals and the police must be informed if in any instance violence or foul play is suspected. Otherwise no writing except the making of short notes will be required from the medical staff. Private patients may be sent to the out-patient department by any medical practitioner or professor if the case is interesting; for such patients a special admission card is necessary and treatment is free. It is estimated that the saving which will result from these new regulations will amount to not less than 24 per cent. of the yearly expenditure, but the number of the patients will, of course, be greatly reduced, so that the effect on scientific work and the opportunities for clinical teaching must be watched.

The Sale of Flowers and Fruit.

The sale of flowers and fruit is largely carried on by street-vendors, who do not always comply with the rules of hygiene necessary in this line of business. As an outcome of some convictions for offences against the regulations relative to food-supply the board of health now requires the dealers in such articles to keep their fruit covered, so as to protect it from dust and other contamination, and not to offer for sale anything which is in a damaged or bad condition. Offenders will be liable to have their stock seized and their licences cancelled.

Injury to the Conus Medullaris.

At a recent meeting of the Society for the Study of Psychiatry and Neurology Professor Schlesinger showed a man who 16 years ago fell from the third floor of a house and was paralysed up to the umbilicus. After three years his condition improved so much that he was able to resume work, when he again fell from a considerable height. He suffered again from paralysis of the lower extremities, with disturbances of the function of the bladder and rectum. This time only the limbs recovered, and the impaired action of the bladder remained so that a severe septic cystitis endangered the life of the patient. He suffers at the present time—seven years after the second fall—from weakness of the legs, loss of sensation for heat and cold in the region supplied by the sacral and first lumbar segments, and incontinence of urine which trickles away without the patient feeling it. Sexual desire is entirely absent, but the man has become the father of two children. In similar cases in which necropsies have been made it has been found that the entire sacral medulla and the grey substance of the lumbar portion of the spinal cord were destroyed. Patients may live for many years with these lesions and may have children, so that the prognosis is not unfavourable, but there is always a liability to ascending pyelonephritis consequent upon the inevitable cystitis.

Sept. 11th.

Obituary.

JOHN CAMERON, M.D. GLASG., F.R.C.P. LOND.

THE death of Dr. John Cameron, which took place at his residence, 4, Rodney-street, Liverpool, on August 20th, at the age of 88 years, has removed a prominent figure from the ranks of the profession in that town. Dr. Cameron went to Liverpool from the Highlands of Scotland in 1839, in which year he obtained the diploma of the Royal College of Surgeons of Edinburgh. For a few years he was identified with the Liverpool South Dispensary as one of its medical officers. In 1843 he graduated as M.D. at the University of Glasgow and in 1873 he became a Fellow of the Royal College of Physicians of London, having obtained the Membership in 1859. A feature in Dr. Cameron's life was his long association with the Royal Southern Hospital. He was originally appointed physician to the hospital for ten years, the customary period at the time. At the end of the term he was appointed for a further period of ten years and later the appointment was made lifelong, his resignation only taking place a few years back. He was always ready to assist the cause of medical science and when the University College scheme was first started he contributed £500. His connexion with the Liverpool Medical Institution was of a unique character. On March 15th, 1899, a gathering was held in the large theatre of the society to celebrate the diamond jubilee of his membership. Having joined the society in 1839 he had been a member of council for many years; he was twice general secretary, vice-president in 1868, and president during the session 1872–73. For 50 years he was continuously in office as a trustee and no member attended more assiduously to his duties. The diamond jubilee gathering was an interesting occasion and was largely attended by the members. The funeral took place on August 23rd and was quite a representative one.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following foreign eminent medical men are announced:—Dr. O. Vierordt, professor of medicine in Heidelberg.—Dr. Jaumes, formerly professor of forensic medicine in Montpellier.—Dr. Gouraud, formerly on the staff of the Paris Hospitals.—Dr. Morache, professor of forensic medicine in the University of Bordeaux.—Dr. Isidor von Neumann, emeritus professor of dermatology and syphilis in Vienna, at the age of 74 years. He studied in Vienna and was assistant to Hebra and subsequently succeeded to his chair. His published works include a Manual of Skin Diseases and another on Syphilis. Three years ago he was ennobled by the Emperor.

Medical News.

THE DUTIES OF PUBLIC VACCINATORS.—At a meeting of the St. Columb (Cornwall) board of guardians held on August 30th a letter was read from the Local Government Board in reference to one of the public vaccinators of the union. The Board stated that the gentleman referred to was in the habit of granting certificates of postponement on trivial grounds, that he had failed to vaccinate his own child successfully, and that he had given a certificate of insusceptibility for the infant. The Board further wished to know if the guardians had investigated the matter and also wished to know the three dates on which the public vaccinator operated on his own child, the source from which he obtained the lymph, and the results which the public vaccinator had obtained whilst using similar lymph on other children. After some discussion the guardians decided to ask the public vaccinator for a reply to these allegations.

THE LOCAL AUTHORITIES (TREASURY POWERS) ACT, 1906.—The Local Government Board has issued circulars to burial boards, town councils, urban district councils, and metropolitan borough councils drawing the attention of these bodies to certain of the provisions contained in the above-mentioned Act. The Act was passed for the purpose of transferring to the Local Government Board certain powers hitherto vested in the Treasury under enactments relating to local authorities. For instance, the borrowing of moneys by burial boards for the purposes of the Burial Acts had to be approved by the Treasury and in the same way the appropriation or alienation of land for the purposes of the Baths and Washhouses Acts had to be approved by the Treasury. Under the new Act the Local Government Board is substituted for the Treasury and it provides that the Board shall exercise as regards every local authority in England and Wales, except the London County Council, any power conferred on the Treasury by any enactment contained in, applied by, or incorporated with the Baths and Washhouses Acts, 1846 to 1899, or the Burial Acts, 1852 to 1900, or any local or private Act as respects dealings with property, loans, and matters connected therewith, and that all such enactments, and all enactments referring to the powers so conferred, shall be construed accordingly. Baths and washhouses, and the questions arising in regard to the disposal of the dead indubitably affect public health, and as the Local Government Board is more in touch with local authorities than that *quasi* obstruction the Treasury, it is likely that the new Act may have a useful bearing upon public health.

LITERARY INTELLIGENCE.—We have received a preliminary prospectus of a journal to be called the *International Medical Review*, to be edited by Dr Hugo Neumann of Berlin. The prospectus states that the object of the review in question is to establish under the form of a periodical journal a permanent exchange of professional knowledge and experience among the medical faculty of the whole civilised world. It is intended to publish the review quarterly and each issue will appear simultaneously in six languages—viz., English, German, French, Italian, Portuguese, and Spanish. The copies will be distributed among medical men in that language which or either native to the country in which they live is is the most generally understood there of all foreign languages. Thus, the review will be distributed in English to medical practitioners in Great Britain, her various colonies and dependencies, in the United States of America, and of foreign countries, in Japan and Persia. The German edition will be distributed to medical practitioners in German-speaking countries of Europe and also in Denmark, Holland, Norway and Sweden, the Russian Baltic provinces, and Finland. The French edition will be distributed to medical practitioners in France and her colonies, and in Belgium Bulgaria, the Dutch East and West Indies, and Greece. The Spanish edition will be distributed in Spain, the Spanish-speaking countries of South America, and the West Indian islands. The review will not only treat of purely scientific medicine but also of such medico-sociological subjects as the treatment of tuberculo-is, the question of prostitution, the questions dealing with the medical laws and regulations in the various countries, climatic conditions, epidemiology, and tropical therapeutics. A special section is to be set aside for questions and answers. An epitome from the various medical publications will be given, especially drawn up with a view to meeting the wants of general practitioners. We await the appearance of the first number of this international review with interest.—A book entitled "Hypnotism and Suggestion" by Dr. Edwin Ash will shortly be published by Mr. J. Jacobs, 149, Edgware-road, London, W. The work, it is stated, is devoted almost entirely to practical hypnotism. It will consist of about 155 pages and the price will be 4*s.* net.—Messrs. Baillière, Tindall, and Cox have recently published a fifth edition, rewritten and revised throughout, of Professor Stewart's "Physiology." The fourth edition referred to in our issue of Sept. 1st is out of print.

ENTERIC FEVER IN PONTYPOOL.—Enteric fever has broken out in Pontypool and the surrounding district and up to Sept. 8th about 90 cases had been notified. At a meeting of the Pontypool district council held on Sept. 5th the medical officer of health (Mr. S. Butler Mason) reported that the epidemic was increasing, notwithstanding that the supply of water which had been regarded with suspicion had been cut off.

OPHTHALMIC APPOINTMENTS IN EGYPT.—The following appointments to sub-inspectorships have been recently made in connexion with the ophthalmic hospitals in Egypt:—Mr. George H. McLaren, M.R.C.S. Eng., L.R.C.P. Lond., late house surgeon, Birmingham and Midland Eye Hospital; and Mr. I. G. Macdonald, M.R.C.S. Eng., L.R.C.P. Lond., late house surgeon, Royal Westminster Ophthalmic Hospital. The appointments are for two years at a salary of £510 a year, with certain allowances. Mr. McLaren has already taken up his duties in Egypt and Mr. Macdonald will join the service in Egypt at the end of October.

CENTENARIANS.—Mr. John Burke of Tremadoc, who is 103 years of age, was quite recently a witness in a right-of-way case at the Festiniog county court. He declared that he had used the path nearly 100 years ago.—The *Times* of Sept. 8th states that Mr. Thomas Price of Welton, near Daventry, has attained his 103rd year. He is in possession of his faculties, and he recalls memorable events occurring in his early manhood, including the birth of Queen Victoria. He drove a well-known county family to London in their coach to attend her late Majesty's coronation. Mrs. Finn, one of his daughters, living at Strand-on-the-Green, Chiswick, is 77 years of age, and has several great-grandchildren.—Mrs. Mary Glover of Hoops on Sept. 7th attained the hundredth anniversary of her birthday.

ROCHDALE INFIRMARY.—A welcome donation of £5000 has been given by the trustees of the late Mr. James Holden, who left nearly a quarter of a million for charitable purposes, to the special fund which is being raised to extend the Rochdale Infirmary as a permanent memorial of the town's jubilee of incorporation. This is in addition to other large sums given by the trustees to the infirmary, and brings up the extension fund to nearly £20,000. As regards the jubilee itself, the chief interest, medically, lies in a comparison of the sanitary condition of the town at the present day, and at the time of incorporation. The population has grown from about 33 000 to 86 390, the increase being partly due to two extensions of territory. About 1856 the birth-rate averaged 34·5 per 1000, and has gradually fallen, almost year by year, to its present low rate of 23·2. In the old borough the death-rate was 23·4, and it gradually increased till it reached 27·0 per 1000. With the increased area given by the extension in 1872 the rate began to fall till it is now 16·7. During the 50 years the reduction in the death-rate has been 6·7 per 1000, compared with 6·0 for England and Wales. These figures are taken from an interesting chapter supplied by Dr. J. Henry, the medical officer of health, to the volume giving the history of Rochdale and marking its jubilee. Dr. Henry attributes the improvement to better sanitary provisions, greater knowledge of true cleanliness, the extension of the borough and diminished density of population, the many Factory and Workshop Acts dealing with steam, temperature, venti ation, &c., and the adoption of improved closet systems. Many years ago the town was distinguished by the very general adoption of dry closets.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.

ATKINSON, E. L., M.R.C.S., L.R.C.P., has been appointed Senior Obstetric House Physician at St. Thomas's Hospital.

CANN, F. J. H., M.B. Lond., has been appointed Certifying Surgeon under the Factory and Workshop Act for the Dawlish District of the county of Devon.

CLARKSON, F., M.B., B.S. Durh., has been appointed a Resident Assistant in the Ear Department at St. Thomas's Hospital.

CORNER, S. G., M.B., Ch.B. Edin., has been appointed House Surgeon at the Essex and Colchester Hospital.

DERRY, BARTHOLOMEW GIDLEY, L.R.C.P. Lond., M.R.C.S. Eng., has been re-appointed Medical Officer of Health for Bodmin (Cornwall).

DODGSON, GEORGE STANLEY, M.B., B.C. Camb., has been appointed Medical Officer to the Sherburn Hospital, near Durham.

ECKENSTEIN, K. E., M.R.C.S., L.R.C.P., has been appointed a Resident Assistant in the Children's Surgical Department at St. Thomas's Hospital.

EYRE, C. R. B., M.R.C.S., L.R.C.P., has been appointed Junior Obstetric House Physician at St. Thomas's Hospital.

FLITCROFT, THOMAS E., L.R.C.P. & S. Edin., L.F.P.S. Glasg., has been appointed Resident Medical Officer at the Warrington Union Infirmary.

GOTELEE, H. E., M.R.C.S., L.R.C.P., has been appointed Senior Ophthalmic House Surgeon at St. Thomas's Hospital.

GRAY, H. T., B.C. Cantab., M.R.C.S., L.R.C.P., has been appointed a Resident Assistant in the Throat Department at St. Thomas's Hospital.

JEFFREY, G. RUTHERFORD, M.B., Ch.B., has been appointed Senior Assistant Physician to the Crichton Royal Institution, Dumfries.

MACLEAN, I. C., M.R.C.S., L.R.C.P., has been appointed a Resident Assistant in the Children's Surgical Department and also in the X Ray Department at St. Thomas's Hospital.

ROBERTS, R. J., L.R.C.P. & S. Edin., has been appointed Certifying Surgeon under the Factory and Workshop Act for the Corris District of the counties of Merioneth and Montgomery.

THOMAS, A. H., L.S.A., has been appointed Certifying Surgeon under the Factory and Workshop Act for the West Drayton District of the county of Middlesex.

TREVES, F. B., M.R.C.S., L.R.C.P., has been appointed a Resident Assistant in the Throat Department at St. Thomas's Hospital.

WALLACE, J., M.R.C.S., L.R.C.P., has been appointed a Resident Assistant in the Skin Department at St. Thomas's Hospital.

WARD, W. C. A., M.R.C.S., L.R.C.P., has been appointed Junior Ophthalmic House Surgeon at St. Thomas's Hospital.

WEBB, G. L., B.C. Cantab., M.R.C.S., L.R.C.P., has been appointed a Resident Assistant in the Skin Department at St. Thomas's Hospital.

WILSON, WILLIAM CHEYNE, M.D. Edin., has been appointed Honorary Physician to the Devon and Cornwall Certificated Industrial School for Girls, Plymouth.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

AYR DISTRICT ASYLUM.—Senior and Junior Assistant Physicians, at £150 and £120 respectively per annum, with board, apartments, laundry, and attendance.

BEDFORD COUNTY HOSPITAL.—House Physician. Salary £80 per annum, with apartments, board, and laundry. Also House Surgeon. Salary £100 per annum, with apartments, board, and laundry.

BIRMINGHAM ASYLUM, Rubery-hill.—Assistant Medical Officer. Salary £150 per annum, with apartments, board, &c.

BRADFORD ROYAL INFIRMARY.—Medical Officer, unmarried. Salary £100 per annum, with board and residence.

BRIGHTON, SUSSEX COUNTY HOSPITAL.—Second House Surgeon, unmarried. Salary £60 per annum, with board, residence, and washing. Also House Surgeon, unmarried. Salary £100 per annum, with board and residence.

BROMYARD UNION.—Medical Officer.

CANCER HOSPITAL, Fulham-road, London, S.W.—Senior House Surgeon. Salary £80 per annum.

CARDIFF UNION WORKHOUSE.—Assistant Medical Officer, unmarried. Salary £130 per annum, with rations, apartments, attendance, and washing.

CHORLTON AND MANCHESTER JOINT COLONY FOR EPILEPTICS, Langho, near Blackburn.—Resident Medical Officer. Salary £150 per annum, with board and residence.

DERWENT VALLEY WATER BOARD.—Medical Officer for Workmen's Village at Birchinlee.

EAST LONDON HOSPITAL FOR CHILDREN AND DISPENSARY FOR WOMEN, Shadwell, E.—House Surgeon for six months. Honorarium of £25, with board, residence, &c. Also Medical Officer for six months. Salary at rate of £100 per annum.

ECCLES AND PATRICROFT HOSPITAL.—House Surgeon, unmarried. Salary £70 per year, with board, residence, and washing.

EGYPTIAN GOVERNMENT, MINISTRY OF EDUCATION.—Professor of Midwifery and Gynæcology. Salary £400 a year. Also Medical Tutor and Registrar to Kasr-el-Ainy Hospital. Salary £400 a year.

ENNISKILLEN, FERMANAGH COUNTY INFIRMARY.—House Surgeon. Salary £52 per annum.

EVELINA HOSPITAL FOR SICK CHILDREN, Southwark, S.E.—Clinical Assistants.

EXETER, ROYAL DEVON AND EXETER HOSPITAL.—Assistant House Physician, unmarried. Salary £50 per annum, with board, lodging, and washing (no stimulants).

GREAT NORTHERN CENTRAL HOSPITAL, Holloway.—Pathologist and Curator. Salary £100 per annum. Also Senior House Physician, Senior House Surgeon, Junior House Physician, and two Junior House Surgeons. All for six months. Salaries of senior officers at rate of £60 per annum and of junior officers at rate of £30 per annum, with board, lodging, and washing.

HASTINGS, ST. LEONARDS, AND EAST SUSSEX HOSPITAL.—House Surgeon, unmarried. Salary £75 per annum, with residence, board, and washing.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—Physician. Also Resident House Physicians. Honorarium £25 for six months.

HUDDERSFIELD INFIRMARY.—Junior House Surgeon. Salary £50 per annum, with board, residence, and washing.

LEICESTER INFIRMARY.—Resident Surgical Dresser for six months. Honorarium £10 10s.

LIVERPOOL INFIRMARY FOR CHILDREN.—House Surgeon. Salary £100 per annum, with board and lodging.

LOWESTOFT HOSPITAL.—House Surgeon, unmarried. Salary at rate of £80 per annum, with board, lodging, and washing.

MANCHESTER EDUCATION COMMITTEE.—Assistant Medical Officer. Salary £200 per annum.

MANCHESTER, UNIVERSITY OF.—Junior Demonstrator in Physiology. Salary £100, rising to £150 per annum.

MIDDLESBROUGH, NORTH RIDING INFIRMARY.—House Surgeon, unmarried. Salary £100 per annum, with residence, board, and washing.

NORTHAMPTON GENERAL HOSPITAL.—Assistant House Surgeon. Salary £50 a year, with apartments, board, washing, and attendance.

NORTH-EASTERN HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Surgeon for six months. Salary at rate of £60 per annum, with board, residence, and laundry.

NORTH-WEST LONDON HOSPITAL, Kentish Town-road.—Second Honorary Anæsthetist.

OLDHAM INFIRMARY.—Senior House Surgeon. Salary £100 per annum, with board, residence, and washing.

ROYAL LONDON OPHTHALMIC HOSPITAL, City-road, E.C.—Senior House Surgeon. Salary at rate of £100 a year, with board and residence.

ST. PANCRAS AND NORTHERN DISPENSARY, 126, Euston-road.—Resident Medical Officer, unmarried. Salary £105, with residence and attendance.

SHEFFIELD ROYAL HOSPITAL.—Resident Medical Officer, unmarried. Salary £50 per annum, with board and lodging.

SHEFFIELD UNION HOSPITAL.—Resident Medical Officer. Salary £100 per annum, with apartments, rations, and allowances.

SHREWSBURY, SALOP INFIRMARY.—House Physician for six months. Salary at rate of £50 per annum, with board and apartments. Also House Surgeon, unmarried. Salary £100 per annum, with board, washing, and residence.

VICTORIA HOSPITAL FOR CHILDREN, Tite-street, Chelsea, S.W.—House Surgeon for six months. Honorarium of £25, with board and lodging.

WEST BROMWICH DISTRICT HOSPITAL.—Resident Assistant House Surgeon, unmarried. Salary £50 per annum, with board, residence, and washing.

WEST LONDON HOSPITAL, Hammersmith-road, W.—Two House Physicians and Three House Surgeons for six months. Board, lodging, and laundry.

Births, Marriages, and Deaths.

BIRTHS.

COLMAN.—On Sept. 8th, at Wimpole-street, W., the wife of W. S. Colman, M.D., F.R.C.P., of a son.

HOUSEMAN.—At Aberdeen, on Sept. 6th, the wife of Edward Houseman, M.B., B.C. Cantab., East India Railway, of a daughter.

MCDOUGALL.—On Sept. 5th, at Benloyal, Woodcote-road, Wallington, Surrey the wife of William Stewart McDougall, M.B., C.M., of a daughter.

MORNEMENT.—On Sept. 8th, at Eastney Barracks, Portsmouth, the wife of Staff-Surgeon R. H. Mornement, of a son.

WEBB.—On Sept. 7th, at Northleach, the wife of Captain H. G. Stiles Webb, R.A.M.C., of a daughter.

WHITFIELD.—On Sept. 9th, at Bentinck-street, W., the wife of Arthur Whitfield, M.D., F.R.C.P., of a son.

MARRIAGES.

GEDDES—ROSS.—On Sept. 8th, at St. Mary's, Livingston, Staten Island, New York, A. Campbell Geddes, M.B., Ch.B., to Isabella Gamble, daughter of W. A. Ross.

HEAD—ROOS.—On Sept. 6th, at St. John's Church, Croydon, Timothy John Head, M.R.C.S., L.R.C.P., to Florence Adelaide May, daughter of G. C. W. Roos.

DEATHS.

ADAMS.—On Sept. 6th, at Hove, James Adams, M.D., M.R.C.S., in his 77th year.

BARKER.—On Sept. 3rd, at Aldeburgh, Suffolk, Gordon Campbell Barker, M.D., aged 40 years.

SMITH.—On Sept. 5th, Leslie Ernest Maule Smith, M.R.C.S., L.R.C.P., aged 24 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

REFUSE IN THE STREETS.

On August 13th the following by-laws of the London County Council came into force:—

Waste paper, refuse, advertising bills, fruit rinds, broken glass, &c.

No person shall (1) sweep or otherwise remove from any shop, house, or vehicle into any street any waste paper, shavings, or other refuse, or being a costermonger, newsvendor, or other street trader, throw down and leave in any street any waste paper, shavings, or other refuse; (2) throw down and leave in any street, for the purpose of advertising, any bill, placard, or other substance; (3) throw down and leave in any street any bill, placard or other paper which shall have been torn off or removed from any bill-posting station.

No person shall deposit in any street or public place to the danger of any passenger, the rind of any orange, banana, or other fruit, or the leaves or refuse of any vegetable.

No person shall throw, place, or leave any bottle or any broken glass, nail, or other sharp substance (not being road material) on or in any street or public place in such a position as to be likely to cause injury to passengers or animals or damage to property.

In these by-laws the expression "street" includes any highway, and any road, bridge, lane, path, footway, mews, square, court, alley, or passage to which the public have access for the time being.

Any person who shall offend against any of these by-laws shall be liable for each offence to a fine not exceeding 40*s.*

The by-laws made by the Council on May 12th, 1903, relative to the throwing down in streets of waste paper, refuse, advertising bills, broken glass, &c., are repealed as from the date on which the above by-laws come into force.

These by-laws are most excellent if only they are acted upon, but by-laws have a way of becoming ignored. There are still plenty of alternating electric light signs to be seen, despite a by-law of the County Council passed forbidding them some years ago; and the "Winner" yeller is still abroad in the land despite an edict of the County Council and of the Commissioner of Police. However, the above by-laws show a desire that the streets of London should be made less filthy. Piccadilly-circus is usually strewed with banana skins, posters of newspapers, omnibus tickets, and dirt of various kinds. A few arrests by the police and a few convictions with the full fine imposed by magistrates will presumably alter this state of affairs; but as yet the by-laws of the County Council appear to be only nominally in force.

THE INFECTIVITY OF TYPHOID FEVER.

To the Editors of THE LANCET.

SIRS,—Can any of your readers inform me whether, and if so for how long, the bacillus typhosus is present in the excreta *after* convalescence has set in, and arising therefrom, and for what length of time, if at all, is it wise to disinfect the stools and urine after convalescence from typhoid fever is well established?

I am, Sirs, yours faithfully,

Sept. 10th, 1906. S.

PRINCIPALS, LOCUM-TENENTS, AND MEDICAL AGENTS.

To the Editors of THE LANCET.

SIRS,—As an agent of 30 years' standing may I be permitted to enter my protest against "Retrospect's" condemnation of agents who do not charge "a uniform fee of half a guinea to each side." Your correspondent's experience appears to be limited to his engagements as locum during three years; allowing him, say, 20 engagements each year, it would give him 60 experiences as locum, and if he took a holiday every year during the 23 years he was a principal we can credit him with 23 experiences. Seeing that the medical profession numbers some 38,000 members, and that probably more than half these require a locum-tenent at least once a year, his experiences during 28 years represent but an infinitesimal proportion of the total. I have tried both systems, and before adopting the plan of not charging a fee to the principal I consulted many on the point and they were unanimous in the opinion that it seemed rather hard on those who were offering engagements at a fair salary to have to pay a fee, seeing that they could get what they wanted at their hospital, or by an advertisement in the medical papers, without going to an agent at all. A good locum-tenent, on the contrary, is only too glad to be kept in constant employment by his agent and pay a fair fee for each engagement. I have effected many thousands of such engagements, charging no fees to principals, and fees varying from 2*s.* 6*d.* to 10*s.* 6*d.* to locums, according to length of engagements (and in exceptional cases where the engagement is very long or at special fees a maximum fee of 21*s.*). I am glad to be able to assert that on an average I do not get one complaint a year from the locum-tenents as to the fee being excessive, nor do I find principals complain of the gentlemen supplied. The best proof of satisfaction is, perhaps, the fact that my locum-tenents hardly ever leave me, except to settle in practice, and that the same principals apply to me repeatedly for the same man or as good a one as they had last time.

I am, Sirs, yours faithfully,

PERCIVAL TURNER.

Adam-street, Adelphi, W.C., Sept. 11th, 1906.

Adenoid.—An English medical man holding British qualifications is permitted to practise in Belgium without passing any examination, but he is required to obtain the written permission of the Belgian Secretary of State for Home Affairs. With regard to France the foreign medical practitioner stands upon exactly the same footing as a French medical practitioner—i.e., he must pass exactly the same examinations as a native Frenchman who desires to practise medicine has to do, and no degree or diploma which he may possess is allowed for in any way, or will excuse him from any of the French examinations. Our correspondent will find full information as regards France at p. 629 of THE LANCET of Sept. 1st.

Anonymous.—1. The wording of the deed of partnership, i.e., the clauses, if any, defining what work should and what should not be considered as coming under the partnership, will decide the matter. If the work in question cannot be brought under the clauses of the deed the point should be made a matter of friendly arrangement between A and B. 2. A and B should not demand fees. The patient should pay them to D on his return, when D should hand them over to A and B. If no fees are tendered D can send in his bill in the usual way and pay the amount over to A and B.

Noise.—Our correspondent will find the law as to nuisances and their abatement by public authorities laid down in Section 91 *et seq.* of the Public Health Act of 1875, but the case is probably more in the nature of a private wrong. We cannot express any opinion as to the legal points involved, in regard of which he is advised to consult a solicitor who can refer to cases in the authorised Law Reports and advise our correspondent as to his remedy (if any), which may be by application to the High Court for injunction. We know of no book on this subject.

Dunstable.—A private house need not be licensed for the reception of a single lunatic patient. Such a patient must, however, be received under the usual reception order and a report on his physical and mental health has to be sent within a month to the Commissioners in Lunacy as they may require. We are not aware whether the Commissioners give information readily to those intending to do as our correspondent proposes, but a letter to the secretary would bring information. A copy of the Lunacy Act, 1890, can be obtained through a bookseller.

Hirsutus (Medicus).—The substance mentioned is an active depilatory. It should be freshly prepared, as if kept it is not unlikely to oxidise into sulphate. If used in the form of paste it is just spread on the hairy skin. If in the form of powder it must be mixed into a cream with water. Caution is necessary in using it on delicate skins, for it is decidedly irritating. In general the hair may be easily rubbed off after two or three minutes.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (17th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Royal Free (2 P.M.), Guy's (1.30 P.M.), Royal Ear (2 P.M.), Children, Gt. Ormond-street (3 P.M.).

TUESDAY (18th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Soho-square (2 P.M.), Chelsea (2 P.M.), Central London Throat and Ear (2 P.M.), Children, Gt. Ormond-street (2 P.M., Ophthalmic, 2.15 P.M.).

WEDNESDAY (19th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic, 1 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Gt. Northern Central (2.30 P.M.), West-minster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Cancer (2 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Ear (2 P.M.), Royal Orthopædic (3 P.M.), Children, Gt. Ormond-street (9.30 A.M., Dental, 2 P.M.).

THURSDAY (20th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Orthopædic (9 A.M.), Royal Ear (2 P.M.), Children, Gt. Ormond-street (2.30 P.M.).

FRIDAY (21st).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), Ophthalmic (10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), City Orthopædic (2.30 P.M.), Soho-square (2 P.M.), Central London Throat and Ear (2 P.M.), Children, Gt. Ormond-street (9 A.M., Aural, 2 P.M.), St. Mark's (2.30 P.M.).

SATURDAY (22nd).—Royal Free (9 A.M.), London (2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), University College (9.15 A.M.), Charing Cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9.30 A.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

LECTURES, ADDRESSES, DEMONSTRATIONS &c.

MONDAY (17th).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith road, W.).—2 P.M.: Medical and Surgical Clinics. 2.30 P.M.: X Rays. Operations. Diseases of the Eye

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M.: Dr. S. E. Dore: Clinique. (Skin.)

TUESDAY (18th).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith-road, W.).—2 P.M.: Medical and Surgical Clinics. 2.15 P.M.: Diseases of the Throat, Nose, and Ear. 2.30 P.M.: X Rays. Operations. Diseases of the Skin.

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M.: Dr. J. E. Squire: Clinique. (Medical.)

WEDNESDAY (19th).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith-road, W.).—10 A.M.: Diseases of the Throat, Nose, and Ear. Diseases of Children. 2 P.M.: Medical and Surgical Clinics. 2.30 P.M.: X Rays. Operations.

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M.: Mr. P. L. Daniel: Clinique. (Surgical.)

THURSDAY (20th).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith-road, W.).—2 P.M.: Medical and Surgical Clinics. 2.30 P.M.: X Rays. Operations. Diseases of the Eye.

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M.: Mr. Hutchinson: Clinique. (Surgical.)

FRIDAY (21st).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith-road, W.).—2 P.M.: Medical and Surgical Clinics. 2.15 P.M.: Diseases of the Throat, Nose, and Ear. 2.30 P.M.: X Rays. Operations. Diseases of the Skin.

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M.: Mr. E. Waggett. Clinique. (Ear.)

SATURDAY (22nd).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith-road, W.).—10 A.M.: Diseases of the Throat, Nose, and Ear. 2 P.M.: Medical and Surgical Clinics. 2.30 P.M.: X Rays. Operations.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITORS," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index to Vol. I. of 1906, which was completed with the issue of June 30th, and the Title-page to the Volume, were given in THE LANCET of July 7th.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1906 are now ready. Bound in cloth, gilt lettered, price 18*s.*, carriage extra.

Cases for binding the half-year's numbers are also ready. Cloth, gilt lettered, price 2*s.*, by post 2*s.* 3*d.*

To be obtained on application to the Manager, accompanied by remittance.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C., are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will insure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

The rates of subscriptions, post free, either from THE LANCET Offices or from Agents, are:—

FOR THE UNITED KINGDOM.		TO THE COLONIES AND ABROAD.	
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Subscriptions (which may commence at any time) are payable in advance. Cheques and Post Office Orders (crossed "London and Westminster Bank, Westminster Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C.

SUBSCRIBERS ABROAD ARE PARTICULARLY REQUESTED TO NOTE THE RATES OF SUBSCRIPTIONS GIVEN ABOVE. It has come to the knowledge of the Manager that in some cases higher rates are being charged, on the plea that the heavy weight of THE LANCET necessitates additional postage above the ordinary rate allowed for in the terms of subscriptions. Any demand for increased rates, on this or on any other ground, should be resisted. The Proprietors of THE LANCET have for many years paid, and continue to pay, the whole of the heavy cost of postage on overweight foreign issues; and Agents are authorised to collect, and generally do so collect, from the Proprietors the cost of such extra postage

The Manager will be pleased to forward copies direct from the Offices to places abroad at the above rates, whatever be the weight of any of the copies so supplied. Address—THE MANAGER, THE LANCET OFFICES, 423, STRAND, LONDON, ENGLAND.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Sept. 13th, 1906.

Date	Barometer reduced to Sea Level and 32° F	Direction of Wind	Rainfall	Solar Radiation in Vacuo	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Sept. 7	30·12	W.	...	114	75	64	62	65	Overcast
,, 8	30 09	W.	...	117	79	58	59	62	Fine
,, 9	30 22	N.W.	...	115	71	58	57	61	Fine
,, 10	30 29	N.	...	110	66	53	51	56	Fine
,, 11	30 35	S.E.	...	115	68	50	51	56	Fine
,, 12	30 21	S.W.	...	102	69	54	57	60	Overcast
,, 13	30 03	S.W.	...	101	67	59	58	63	Cloudy

During the week marked copies of the following newspapers have been received: *The Times, Scientific American, Wakefield Express, Dundee Courier, Macclesfield Courier, Glasgow Herald, Chatham Observer, The Irish Times, Bolton Chronicle, Western Mail (Cardiff), Newcastle Chronicle, Cork Constitution, Bristol Times, Literary Digest, Herts Mercury, Birkenhead News, Daily News, Rotherham Advertiser, &c.*

Communications, Letters, &c., have been received from—

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